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ABSTRACT

This project termination report deals with an environmental education curriculum developed by the Center for the Development of Environmental Curriculum and Willoughby-Eastlake City School District (Ohio). During the three years of the project, 34 units for elementary teachers and 34 units for secondary teachers were prepared. All curriculum materials were field-tested in classroom situations in urban, suburban, and rural communities in northeast Ohio. Two juries were contacted to review the elementary and secondary materials. The results of the final jury evaluation indicated that 31 of the 34 elementary units and all 34 of the secondary environmental units met the minimum level of acceptance. This report includes a summary, a needs assessment, description of local education agencies, and project participants, project goals, project recommendations concerning this project. Appendixes are also included. (TK)

CENTER FOR THE DEVELOPMENT OF ENVIRONMENTAL CURRICULUM

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PROJECT 45 - 71 - 215 - 3

PROJECT TERMINATION REPORT
FOR ESEA TITLE III GRANT FOR THE PERIOD BETWEEN
AUGUST 15, 1971 AND AUGUST 14, 1974

SUBMITTED
NOVEMBER 14, 1974
BY THE
WILLOUGHBY-EASTLAKE CITY SCHOOL DISTRICT

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An ESEA Title III Grant

Project No. 45 - 71 - 215 - 3

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OHIO DEPARTMENT OF EDUCATION

BASIC DATA FORM-2

ESEA Title III
Division of Planning and Evaluation
908 Ohio Departments Building
65 South Front Street
Columbus, Ohio 43215

Project Title
Local Education Agency
Project Director

Superintendent	
Arthur S. Holloway	
Superintendent's Signature	Date
Arthur S. Holloway	January 14, 1975

TABLE 1
NUMBER OF PUBLIC AND NONPUBLIC SCHOOL STUDENTS, TEACHERS, AND COUNSELORS PARTICIPATING

	DIRECT PARTICIPATION						INDIRECT PARTICIPATION					
	STUDENTS		TEACHERS		COUNSELORS		STUDENTS		TEACHERS		COUNSELORS	
	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Public		4,713		105					50	50		
Nonpublic		750		18					10	10		

TABLE 2
NUMBER OF STUDENTS SERVED BY TARGET POPULATIONS

Target Populations	Black	Spanish Surname	Indian	Migrant	Disadvantaged	Handicapped	Prekindergarten through Grade 3	Other
Number of Students Served	1,818 *	50*			1,700*			

* All figures estimates based upon best available information

TABLE 3
RURAL/URBAN DISTRIBUTION OF PUBLIC AND NONPUBLIC STUDENTS IN DIRECT PARTICIPATION

Number of Students in Rural Areas		Number of Students in Standard Metropolitan Areas	Number of Students in Other Urban Areas	Total (Equal total of public and nonpublic students reported in Columns (b) and (c) in TABLE 1)
FARM	NON-FARM			
600	1,126	1,973	1,764	5,463

PROJECT ABSTRACT

Primary Target Population	Number Served
Secondary School Teachers	Approximately 123

SUMMARY DESCRIPTION

The goal of the Center for the Development of Environmental Curriculum is to develop an interdisciplinary environmental curriculum for grades K-12 which would assist in the development of the environmentally literate citizen. During the third year of the project, most of the project activities were directed towards the development and evaluation of the curriculum guides for secondary teachers.

MAJOR OBJECTIVES

1. To develop the secondary portion of the environmental curriculum.
2. To determine the effectiveness of Volume #1 of the Annotated Catalog of Environmental Learning Resources.
3. To develop Volume II of the Annotated Catalog of Environmental Learning Resources.

ACTIVITIES TO ACHIEVE OBJECTIVES

1. Thirty-eight writers were contracted to prepare 34 units for secondary teachers. These writers followed guidelines and directives established by the project staff.
2. The second volume of the resource catalog was prepared using the same format and design as the first catalog. Approximately 325 resources were included.

EVALUATION STRATEGY

1. Approximately 123 secondary teachers piloted the 34 environmental units developed during the third project year. In addition, a jury of experts reviewed the first draft and final draft materials.
2. Evaluation experts were contracted to conduct a study of the first resource catalog using teachers in northeastern Ohio, who responded to a series of questions related to the content and potential use of the catalog.

EVALUATION FINDINGS

1. In the final evaluation phase, all 34 units met the minimum level of acceptance, thus indicating they provide a valuable curriculum contribution toward classroom teachers wishing to implement environmental concepts into their school program.
2. The evaluation results of the catalog were so overwhelmingly positive that statistical analysis was impossible. Vertually every aspect of the evaluation was in the 90th percentile.

A. SUMMARY

The Center for the Development of Environmental Curriculum was funded between August 15, 1971 and August 14, 1974, for the purpose of developing an interdisciplinary environmental curriculum for grades K-12 which will be an important component in the development of the environmentally literate citizen.

During the three years of the project, thirty four units for elementary teachers and thirty four units for secondary teachers were prepared. The elementary units were written by members of the project staff between May, 1972, and November, 1972. The thirty four secondary units were prepared by classroom teachers, environmental experts, and content specialists between October, 1973 and January, 1974.

All curriculum materials were field tested in classroom situations in urban, suburban, and rural communities, primarily in school systems located in northeastern Ohio. During the elementary pilot program, 69 teachers from nine school systems participated. The secondary pilot program involved 123 teachers representing sixteen school systems. The purpose of the pilot program was to obtain evaluative data on the applicability and potential success of the curriculum materials.

Two juries were also contracted to review elementary and secondary materials. The first jury, composed primarily of school administrators, curriculum and instruction experts, and environmental experts, reviewed the materials for content validity and curriculum appropriateness. The second jury, composed of classroom teachers and many members of the first jury, reviewed the materials for potential success.

The results of the final jury evaluation indicated that 31 of the 34 elementary units and all 34 of the secondary environmental units met the minimum level of acceptance.

Two other major publications, prepared by the project, are Volume I and Volume II of the Annotated Catalog of Environmental Learning Resources. The Volume I catalog reports approximately 200 resources and Volume II approximately 325 resources. These catalogs, which include a variety of items from commercial publishers, government agencies, other projects, and miscellaneous sources, are designed to aid the administrator or classroom teacher wishing to supplement the environmental curriculum materials developed by the project.

Because the project was concerned with development rather than dissemination, the responsibility for publication and distribution of the curriculum materials was assumed by other educational agencies. The Ohio Department of Education printed and disseminated approximately 15,000 copies of the K-6 curriculum and Volume I of the resource catalog. Copies are available free of charge upon request.

The secondary curriculum and Volume II of the resource catalog are currently not available for distribution. Approximately 125 copies of the secondary curriculum and 550 copies of the Volume II resource catalog were published for use by twelve school systems within Ohio presently participating in the implementation of the K-12 environmental curriculum. These twelve school systems were funded by Ohio ESEA Title III through a project entitled "Adaptation Grants" designed to implement selected ESEA Title III projects. At present, no plans have been made for future printings of the secondary curriculum guides.

The K-12 curriculum guides and the two resource catalogs are reported in the publication entitled ERIC Research in Education. Complete curriculum guides and resource catalogs are available on either microfiche or hard copy from the ERIC Document Reproduction Service. Dissemination through Xerox University Microfilm, Ann Arbor, Michigan is also being considered. The curriculum materials developed by this project are not copyrighted.

One of the original objectives of the project included establishing criteria and developing evaluative instruments to measure cognitive and affective impact of the curriculum materials. Between June, 1972 and April, 1973, project staff worked with evaluation consultants in the development and validation of three cognitive and three affective instruments for use in grades K-6. The first draft materials were developed and field tested in classrooms of schools involved in the piloting of the elementary curriculum.

The considerable time and money that went into this project objective distracted from the project goal, the development of an interdisciplinary environmental curriculum. Thus, the objective was not included in the third year of the project.

Another objective was related to the sponsoring of inservice workshops and leadership conferences for teachers and school administrators. Throughout the three years of the project, inservice workshops were sponsored for educators closely associated with the project, e.g., pilot teachers, curriculum writers, and curriculum revisors. These workshops were necessary for either development, evaluation, or revision of the curriculum materials.

During the first year of the project, five leadership conferences for school decision makers were sponsored throughout Ohio for the purpose of informing them about environmental education, and the applicability of this area of study to their school curriculum. These conferences required considerable time, both to plan and to conduct. Because they tended to be dissemination activities rather than development activities, it was decided that these leadership conferences were not consistent or supportive of the project goal. Thus, the objective related to sponsoring of the leadership conferences was discontinued after the project year.

The major recommendation related to this project concerns publication of the curriculum guides, especially the secondary guides and Volume II of the resource catalog, and the opportunity for school systems and teachers to implement the environmental curriculum. The Adaptation Grants previously mentioned are the only mechanism presently available to serve the implementation phase. During the 1974-1975 school year, twelve school systems are involving approximately 475 teachers in this effort. Plans must be made to disseminate the environmental curriculum to a greater number of teachers if the long-time goal of developing an environmentally literate citizen is to be accomplished.

B. NEEDS ASSESSMENT

During the early 1960's, public attention was being directed towards the state of our environment by many authors, as Rachel Carson, Barry Commoner, Aldo Leopold, and Raymond Dasmann. Soon thereafter, professional interest in Environmental Education began to develop. The Journal of Environmental Education published activities by experts such as Dr. Robert Roth, Ohio State University, and Dr. William Stapp, University of Michigan, which established the fundamentals of environmental education.

An environmental education program is necessary because of the continuing environmental problems. Air pollution affects the entire atmosphere of our planet. Carbon monoxide, sulfur oxides, hydrocarbons, particulate matter, and nitrogen oxides are being spewed into our thin atmosphere at an alarming rate. Since 1966, this country alone has increased its pollution of the air by five million tons of pollutants annually. Medical evidence substantiates a significant increase in the U.S. death rate from lung cancer and emphysema because of increased air pollution. Aside from health considerations, the cost of air pollution in 1969 to American taxpayers was $13.5 billion, a figure that continues to increase. The nation's water quality is diminishing annually. Virtually every stream, river, and lake in the United States is, in some way contaminated by pollutants. Water pollution caused disease, cholera, typhoid, dysentery, and hepatitis being the most common ones associated with polluted water. Water pollution takes an enormous toll on wildlife and recreational activities. Aside from this, water pollution costs money as more and more sewage treatment plants are required to handle the ever growing problem. Each year sees an increase in the number of endangered species of wildlife. As man continues to plunder natural wild lands in the name of economic progress, wildlife suffers a loss of habitat and an increase in pollution. As the demand for timber increases, our forests are disappearing from the face of the earth.

The increase in population rates, overcrowded cities, the disappearance of green spaces, the mechanization of daily life--all of these factors are likely to be among the major causes of an increase of crime in the streets, a higher incidence of mental illness, and youth's disillusionment with "the system" that their elders have fashioned. To quote from

the original grant proposal:

> Ten years ago...urbanization of our native lands and pollution of the water and air were seemingly restricted only to large metropolitan areas, and the resulting environmental deterioration inconvenienced only the city dweller, the person responsible for the problem.

Today, the problem inconveniences the majority of the population of the world; pollution is everybody's problem.

It is because of the very existence of this situation that the Center for the Development of Environmental Curriculum sees the need for a program in environmental education for the schools in the state of Ohio.

Social change of this type, that is, correction of environmental problems, is a gradual process. To be truly effective, changes in overt behavior which are produced by laws must be reinforced by changes in underlying values and beliefs of individuals. No social problem can be really solved unless individuals voluntarily participate in the solution; participate because they believe the problem is wrong and are committed to its correction. It is the process of education, more than any other process in society, which concerns itself with developing this voluntary disposition of behavior. Such changes in beliefs and values take time and may require more than one generation to be achieved. The school's special role in the correction of social problems is with the way the next generation of adults develops. Especially important to the school is the structure of beliefs and values that the next generation cultivates. While parents and other adults also educate, they cannot be totally relied upon to develop positive values and beliefs toward the environment. Laws may change the overt behavior of adults in society but will not necessarily produce value changes. Unless parents themselves change their values, there is little likelihood that they will develop positive values concerning social problems within their children. The school, then, is really needed to aid laws as a way of effecting a major social change over a period of time. For a program in environmental education to be effective, it must bring about change in the attitudes of people and the way people voluntarily are inclined to behave toward the environment.

Formal education, i.e., the school, is more disposed to intentionally and deliberately take upon itself the task of bringing about a new set of values that will effectively reinforce the legal changes which have been made regarding the behavior of individuals in our society. The school as a formal institution works with a population that, for the most part, has not yet fully developed all of its attitudes. The values of the school population are still in the formative stage, so,

as a result, the formal learning that is conducted can influence to a maximum degree the solidification of the attitudes which students will eventually select and identify with, or reject in their adoption of a value system for daily living.

The environmental problem has a wide range of components calling for use of knowledge from a number of different fields of subjects and disciplines; in reality, there is no other place in society except that of formal education where all disciplines are systematically related and taught. This point is also made in the Guidelines for the Environmental Education Act:

> The environmental education process, then, is dynamic--it changes as the needs of people change. It cannot be confined to a single discipline, grade level, age group, or segment of the population. Thus, environmental education is a vehicle by which traditional but unmet, as well as new educational goals can be achieved. It can facilitate the rethinking and redirection of educational practices necessary to achieve these goals.

Education is one of the processes by which people come to hold certain values, and if schools are not included in the solution, it is doubtful that the environmental problem will ever be solved because of its complex nature.

Between September, 1967 and August, 1970, Project PLEASE (Pollution, Life, and Earth Applied Science Enrichment) was operating in the Willoughby-Eastlake City Schools. Project PLEASE, funded by an ESEA Title III grant, developed an environmental education program for grades 1 thru 7 for schools within the school district. In addition to development and maintenance of the school program, PLEASE made many contacts with environmental organizations, through which a vast volume of information was obtained.

Although several areas of the country began developing environmental programs, an extensive inventory conducted by members of the PLEASE staff in 1969 revealed that few comprehensive environmental programs were available for adoption into Ohio schools.

One member of the original PLEASE staff remained in the Willoughby-Eastlake Schools. Because of the familiarity and experience with environmental education, the Willoughby-Eastlake City Schools was an ideal site for the establishment of a project to develop an environmental curriculum.

Prior to the submission of a formal grant application, meetings were held with officials of the Ohio Department of Education (ODE) to determine their reaction to the proposed project. Reaction was

favorable because environmental education had been identified as one of the ten critical educational needs in Ohio.

C. DESCRIPTION OF LOCAL EDUCATION AGENCIES AND PROGRAM PARTICIPANTS

The Center for the Development of Environmental Curriculum (CDEC) was funded through the Willoughby-Eastlake City Schools, Lake County, Ohio. Because of the goal to develop an interdisciplinary environmental curriculum for Ohio Schools, CDEC employed environmental experts, school administrators and teachers, and curriculum and instruction experts throughout Ohio and neighboring states to assist in this development process.

The majority of school administrators and teachers involved in the project were employed by schools located in northeastern Ohio. This decision was made due to the proximity of participating schools to the Willoughby-Eastlake City Schools. CDEC staff members regularly visited participating teachers and administrators to discuss the progress of the program. If participants had been located in other regions of Ohio, the time and expense of travel would have been prohibitively expensive.

CHARACTERISTICS OF PARTICIPATING SCHOOL SYSTEMS

Throughout the development and evaluative processes, CDEC involved schools characteristic of districts throughout Ohio. Participating districts represented urban, suburban, rural, and non-public school systems.

For the elementary and secondary programs, the following criteria were used to identify participating schools:

1. The schools in the pilot program should be located within one hour travel of project headquarters in Willoughby, Ohio. Continuous direct contact with teachers employing the curriculum is necessary often for periods of up to half-day duration for purposes of advisement and observation. With a project staff of limited size, it is therefore necessary to reduce travel time and expense.

2. The school districts in the pilot program should have a full kindergarten through twelfth grade academic program.

3. The schools in the pilot program should have no formal environmental education program.

4. The schools identified to participate in the pilot program should be representative of the widest possible range of socio-economic strats.

In most cases, schools did fit the designated criteria. During the secondary pilot program, one school district was more than one hour's travel time away from Willoughby. This district, the Columbus City Schools, was monitored by a consultant in Columbus hired by CDEC. Two school systems did not have kindergarten programs.

For the elementary program, school systems representing the following communities were involved:

1. Central or Inner City: Schools in this class serve lower income, blue collar neighborhoods, and are in metropolitan areas of populations of 40,000 people or more. In addition, an overwhelming proportion of people in these neighborhoods or communities have membership in minority racial or ethnic groups. In northeast Ohio, most minority group membership falls into two catagories: Black (Afro-American), and Puerto Rican. Other minority groups, such as Mexican-Americans and American Indians are not concentrated in large numbers in northeast Ohio.

2. Suburban Upper Class and Upper Middle Class: This class of schools serves neighborhoods of suburban populations of 2,500 to 50,000, and are generally inhabited by households whose heads are college graduates and have professional, technical, or middle and upper management positions. There are two major geographical locations for these communities: a) the outermost ring of central city neighborhoods and the first ring of suburbs. These are generally older communities, yet quite stable because of their affluent character and their proximity to downtown where many of the inhabitants work. Cleveland's first ring of suburbs -- Bratenahl, Cleveland Heights, Shaker Heights, Lakewood, Rocky River, Fairview Park -- represents a class example of this type of community. b) the communities popularly known as "Exurbia". The affluent upper middle class also choose to live in communities in the third and fourth rings beyond the central city because they wish to pursue a mixed rural and suburban lifestyle. In the Cleveland area, the ring of communities adjacent to the Outerbelt Freeways, especially Interstate 271, are examples of the second type of Suburban Upper Middle Class type of community -- Pepper Pike, Gates Mills, Willoughby Hills, Orange.

3. Suburban Middle Class and Working Class: This class of

schools serves relatively new communities inhabited largely by people migrating away from the expansion in the central city by minority groups. The community size is between 2,500 and 50,000 inhabitants. This is essentially a mixed blue and white collar population where the white collar occupations are heavily concentrated in the clerical, sales, and lower management areas. Compared to the Suburban Upper Middle Class category, there are significantly fewer parents with college degrees. Achievement motivation is also less strong. European nationality identification (especially southern and eastern Europe) still marks the communities much in the same way they were formerly characterized as neighborhoods in the central city. Often these are the fastest growing cities in a standard metropolitan area. In the Cleveland area, Richmond Heights, Mentor, Parma, and Brookpark are examples of this type of community. Among somewhat older communities, Euclid and Bedford have received white migration from the central city. This class of community is almost wholly white and militantly opposed to minority group in-migration. The Suburban Upper Middle Class group of communities is more tolerant of, or less threatened by, minority group in-migration, especially of minority group members with similar educational and occupational levels.

4. Rural: These are small town and farming communities of less than 2,500 people and are generally served by Local School districts. Neither the town nor the school district has grown in size during the present century. Often the towns will have lost a considerable proportion of their populations to the suburban areas of the central cities as small industrial plants and small farms can no longer compete with larger units. In northeast Ohio, many of these communities are as poverty stricken as those in the inner city.

5. Non-Public: The fifth class of schools is almost exclusively under the auspices of the Roman Catholic Diocese School systems which serve northeast Ohio. The socio-economic composition of the students in these schools is most similar to category 3, Suburban Middle Class and Working Class.

In the secondary program, the similar criteria were used with the following amendment. The suburban classification combined both criteria #2 (Suburban Upper Class and Upper Middle Class) and criteria #3 (Suburban Middle Class and Working Class) into one classification

named "Suburban". The Classification of "Non-Public" as a separate criteria was eliminated. The "Non-Public" schools were included with the classification which their student population represented. Thus, the classifications were Central or Inner City, Suburban, and Rural.

During the project, 9 school districts participated in the elementary phase, and 16 school districts participated in the secondary phase. The names of the participating school districts are listed in Appendix A.

CHARACTERISTICS OF PARTICIPATING ELEMENTARY AND SECONDARY TEACHERS

The criteria used for selection of the elementary teachers was:

1. between three and ten years of experience.
2. in self-contained classroom settings.
3. without any previous program in environmental education.
4. interested in participating in the pilot, although perhaps naive about environmental education.

In preparation of the pilot program, CDEC sent an introductory mailing to the teachers on June 29, 1972. The purpose of this was to prepare the teachers as to the dimensions of environmental education and the purpose of the pilot program, and to gather biographical data and an indication of environmental attitude about each teacher.

A total of 69 elementary teachers participated in the piloting of the elementary environmental curriculum materials.

The biographical data indicated the average age of the teachers was 36.8 years, and that they had taught an average of 10.5 years. In terms of education, 64 teachers had Bachelor's degrees and 5 had Associate degrees. Fifteen teachers also had Master's degrees.

While 38 percent of the teachers considered themselves avid environmentalists, only 28 percent ever had a formal course in natural history. Of the teachers responding, 33 percent subscribed to environmental publications and one percent belonged to an environmental or conservation group. All but one teacher felt they would support legislation for environmental protection, and all but five teachers would be willing to pay higher taxes to curb pollution.

A Summary of the biographical data is:

Area	Average Age	Average Yrs. Teaching Exp.	Total Students	Average No. of Students Per Class
Inner City	42.7	14.4	624	39.0
Suburban I	35.5	9.6	504	33.6
Suburban II	36.0	10.6	345	31.3
Rural	35.0	7.6	511	29.5
Non-Public	35.0	10.7	521	37.2
Total Averages	36.8	10.5	2505	34.3

The distribution of number of years teaching experience is:

# Years Experience	# Teachers
0-2	15
3-10	28
11-15	7
16-20	10
21-42	8
	68

Upon inspection of the biographical data, it became obvious that the participating teachers did not meet all of the criteria. Because of the limited number of teachers in the pilot schools, it was impossible to find enough teachers that fell within the 3-10 year experience range that were interested in participating in the pilot. As a result, other teachers were selected.

The criteria of interest was considered paramount to the pilot program. It was felt that the uninterested teacher would not contribute the

time and effort required to both use the materials and to provide the type of feedback necessary for evaluation and revision. In two schools, it was learned a large percentage of the teachers were "volunteered" by their administration. These teachers, participating against their wishes, proved to be of little value in the pilot. They, in fact, may have created greater problems because of discouraging the other teachers. This situation is extremely difficult to both enumerate and interpret, because the basis is largely personal observation of the CDEC staff. It is felt though, that approximately 20% of the teachers fell into the non-volunteer category.

The criteria for selection of secondary teachers to participate in the pilot program were:

1. volunteer and interest in environmental education
2. minimum of one year teaching experience
3. willing to teach two units over an eight week period
4. willing to attend one workshop and at least two reporting meetings
5. willing to provide evaluative data to CDEC through written reports

In addition to the biographical information sheets, participating secondary teachers were required to sign a contract which specifically stated the nature of their commitment and responsibilities. Most of the criteria for the selection of secondary teachers were met. The one exception again related to the "volunteer" status of some participants. An estimated 15 percent were "volunteered" by the administration of the school system.

A total of 74 junior high teachers and 49 high school teachers participated in the piloting of the secondary curriculum materials. Representation by urban, suburban, and rural communities was nearly equal.

The age range of pilot teachers is:

Age	Junior High	Senior High
20-25	16	6
26-30	24	14
31-35	15	11

Age range of pilot teachers (Cont.)

Age	Junior High	Senior High
36-40	8	6
41-45	10	4
46-50	5	3
51-55	2	2
56-60	0	1

The distribution of the number of years teaching experience is:

# Years Experience	# Teachers Junior High	Senior High
1-3	18	8
4-10	41	24
11-15	11	6
16-20	9	7
21-30	2	3

Twenty seven of the seventy four junior high teachers and seventeen of the fourty nine senior high teachers had Master's Degrees.

The number of students involved by community was:

	Total # Students	Average # Students per class
Inner City		
Junior High	1309	29.4
Senior High	711	26.5
Suburban		
Junior High	1248	29.5
Senior High	516	22.1
Rural		
Junior High	941	26.8
Senior High	782	24.4

CHARACTERISTICS OF SECONDARY CURRICULUM WRITERS

As proposed in the strategy for development of the curriculum, teacher-writers were contracted in order to meet the August, 1974 deadline. In the previous progress report, strategies for the selection of writers were outlined. Criteria for selection included:

1. interest
2. willingness to participate
3. expertise in their fields
4. working experience
5. ability to write
6. responsibility
7. previous experience in writing

Thirty-two writers were originally contracted and assigned unit topics. As expected during the writing period, there were changes and withdrawals before the period ended, and several deadlines were changed due to these adjustments. Of the original thirty-two writers, four withdrew due to lack of time, interest, or illness in the family. There were four topic changes due to interest and ability. An additional five writers were hired to fill gaps and support difficult topics. Because of his interest and capability, one writer was contracted to write two units. A total of thirty-seven writers completed units.

Since the CDEC secondary curriculum had been identified for state-wide dissemination, it was proposed that the writers, as realistically as possible, represent a broad cross-section of backgrounds and experience. Therefore, teaching location (rural, suburban, urban) as well as type of school (public, parochial, private) was taken into consideration. A profile of the CDEC writers shows that these considerations were met.

All thirty-seven of the writers are in some way connected with the teaching of young people, either in the school, the natural setting, the library, or related positions. The summary of the writers' professions is:

Profession	Age Group Served					
	Elementary	Junior High	Senior High	College	Varied	Total
1. Natural Area Administrators					1	1
2. District Director-Cleveland Council for Campfires					1	1
3. Teachers	3	15	9	2		29
4. Environmental Educators and Naturalists					5	5
5. Librarians					1	1
	3	15	9	2	8	37

School and neighborhood settings play an important part in the method and emphasis used in any teaching. Of the thirty-seven writers, 16 percent (6 writers) were employed in rural settings; 38 percent (14 writers) in suburban settings; 30 percent (11 writers) in urban settings; and 16 percent (6 writers) in special (college) or diverse settings. Of the 29 writers who were teachers, 75 percent (22 writers) teach in public schools; 14 percent (4 writers) teach in parochial schools; 7 percent (2 writers) teach in colleges; and 3 percent (1 writer) teach in a private school.

The broad range of experience in teaching can be seen below:

Teaching Experience

# Years Experience	# Teachers
2	5
3	2
4	3
5	3
6	3
8	5
9	1
10	2
11	2
13	1
16	1
18	1
20	2
	31 Total

Writing experience ranged from no professional experience to 26 published magazine articles. Some of the varied experience include: ghost writing for political campaigns; a children's book for Rand McNally; revision of the CDEC elementary units; a 12 week biology curriculum; a 7th grade science-reading development writing grant for the Jennings Foundation; professional book and library reviews; a chapter in a book by the Ohio Academy of Science; unpublished short stories; writings for the institute for Environmental Education; editing and writing for newsletters: articles in Audubon Nature Bulletin and the Michigan Botonist, the American Journal of Botony, the Explorer (Cleveland Museum of Natural History); and a laboratory manual published by Kendall Hunt Publications.

D. PROJECT GOALS

The Center for the Development of Environmental Curriculum was funded for the purpose of the development of an environmental curriculum for grades K-12 that would have application to schools in Ohio. The purpose of the curriculum is to assist in the development of the environmentally literate citizen who is capable of using the skills of critical thinking to be used when evaluating environmental conditions. The curriculum will assist with the development of a student who is knowledgeable of socio-cultural and bio-physical components of the environment and the related problems, is aware of alternatives available for solving the problems, and is motivated to work towards their solutions.

Although the curriculum is oriented towards students, the materials provide guidelines and techniques for use by the classroom teacher. In order to implement and operate an affective environmental education curriculum, the classroom teacher must be involved.

The initial objectives as stated in the original grant application were:

1. To conduct a comprehensive inventory and assessment of existing materials and programs directly related to environmental education;

2. To develop a set of instructional objectives (cognitive and affective development) which would be used as guidelines for development of all other materials;

3. To develop an interdisciplinary environmental curriculum for grades K-12 which could be integrated with other programs within the existing curricular structure;

4. To identify techniques and methods for evaluation of the materials themselves, as well as developing criteria for measuring student and teacher performance and attitudes;

5. To publish and disseminate an environmental curriculum; and

6. To conduct inservice workshops designed to assist in the implementation of the environmental curriculum in individual school programs through the motivation of and behavioral changes in teachers and administrators.

These objectives will be discussed in detail in Section F: Project Outcomes. During that discussion, changes in the objectives will be mentioned.

E. PROJECT DESCRIPTION

Below is the cost of project operation between August 15, 1971, and August 14, 1974:

Total Federal support under ESEA Title III	$465,755.00
Total Federal support other than ESEA Title III	-0-
Total non-Federal support	-0-
Total project cost	$465,755.00

As stated in the goal section, the environmental curriculum for grades K-12 was developed for the purpose of assisting in the development of the environmentally literate citizen.

The format of the environmental curriculum product was the topic of many discussions and considerable investigation. Many formats were considered as to which would be affective, inexpensive, and easy to implement. The final format selection for a printed teachers' guide was finally made by the CDEC staff.

The main reason for the selection of the printed manual format for teachers was based upon the time and expense of publication and dissemination, and because of the lack of information related to the amount of training services that would be available to assist with program implementation.

With the large number of teachers and students in public and private schools in Ohio, the teacher guides seemed to be the most effective

method of providing quick access to the environmental curriculum. Student materials are occasionally included in the teacher guides as examples of worksheets. Student materials were not developed because of the expense of providing sufficient copies for hundreds of thousands of students throughout Ohio.

In the original project implementation, it was stated that with all probability, the complete K-12 curriculum would not be within the three years of the project contract. It was hoped that a fourth extension year to complete the secondary environmental curriculum would be granted.

During the second year, the project director was informed by ESEA Title III officials in Columbus that the fourth year extension was no longer available. Thus, it became evident that if the goal of the project was to be completed, amendment of the time of activities and project procedures would be necessary.

The original concept of the curriculum development process was to employ, as a part of the project staff, content and educational experts who would prepare the curriculum materials. The thirty-four units for grades K-6 were prepared by project staff.

Because of the amount of work necessary to complete the secondary curriculum, and with only one year to do so, the method of development was altered. Instead of using project staff as developers of the units, consultants were hired for this purpose. Between May 1, 1973, and October 1, 1973, project staff prepared the objectives, directions, unit outlines, and format structure for the secondary curriculum. The consultants, contracted to develop the secondary curriculum, had varied backgrounds. Many had experience in writing prior to their involvement with CDEC, and all had prior experience working with students.

During the writing period which was between October 7, 1973, and January 1, 1974, thirty-four secondary environmental units were prepared. Most units were closely related to the outlines and intent identified by CDEC prior to the writing period. A limited number of units needed moderate revision. All units were ready for the pilot program which began February 1, 1974.

Had CDEC not changed its procedure and contracted teachers and environmental educators to prepare the secondary environmental curriculum materials instead of project staff, there is little doubt that the secondary curriculum would not have been completed by the August 1, 1974 deadline. The secondary curriculum was completed on May 1, 1974.

The environmental curriculum for grades K-12 is divided into the following: grades K-2; grades 3-4; grades 5-6; bio-physical, junior

high school; bio-physical, senior high school; socio-cultural, junior high school; socio-cultural, senior high school; other curriculum areas for junior high school and senior high school. The rationale for the scope and sequence will be discussed in detail in objective #3 which relates to the development of the curriculum.

F. PROJECT OUTCOMES

In order to better understand the nature of the objectives, each will be discussed individually and in sufficient detail so as to provide a comprehensive explanation of the activities and the degree of success of attainment of the objective.

> Objective #1: To survey current philosophical environmental concepts and to assess available resources which include people, materials, and programs, which will be judged on a qualitative basis and rated upon a descriptive element. The descriptive element will include consideration of format, cost, learner level, teacher preparation, time for lesson, applicability, and other descriptors.

This objective has two separate parts. First is the surveying of philosophies and current thought concerning environmental education, which will serve as the basis for development of the instructional objectives and teaching units. The second relates to the publication of a catalog of environmental resources which would be useful to teachers, supervisors, and administrators wishing to implement an environmental program. These two portions will be discussed individually.

SURVEY OF CURRENT PHILOSOPHICAL ENVIRONMENTAL CONCEPTS

The survey of current philosophical environmental concepts was identified in the initial grant application as the first stage in the development of the interdisciplinary curriculum. The activity was essential to the formalization of a project philosophy for environmental education from which curriculum objectives and eventually, curriculum materials would be derived.

Prior to the beginning of the survey, it was necessary to establish guidelines by which to identify acceptable philosophies. Obviously there is an infinite number of positions concerned with one's relationship with the environment. These philosophies range from total exploitation of all resources to the preservation of all

resources. Criteria for the evaluation of the philosophical position included:

1. Wise resource management in relation to the health of the total community.

2. Relation of short-run gains of resource utilization versus the long-range effect on the environmental life systems.

3. Educational substance of the philosophy.

4. The goals of an environmental education curriculum.

5. The level of environmental consciousness necessary among citizens.

6. The concern for specific knowledge, content, and skills in an environmental education curriculum.

7. Effectiveness of the curriculum approach.

8. The type of student involvement.

After extensive literature search, philosophies were collected and reported in a publication entitled "Toward a Philosophy of Environmental Education", which was completed on December 1, 1971.

Although no criteria were listed in the evaluation design pertaining to the acceptability of the philosophy survey, the report was judged acceptable by the Title III office in a letter dated February 8, 1972.

The survey of current philosophies provided a basis for the development of CDEC's philosophical position. With the assistance of a team of four consultants from the Department of Education, Case Western Reserve University (CWRU), the CDEC staff prepared a statement of philosophy reflecting CDEC's goals for environmental education in Ohio schools.

The development of the project's philosophy was a team effort of the entire staff, and began with a critical analysis of the philosophy survey report. Each staff member prepared a personal goal of environmental education. These goals were then discussed and analyzed from the points of clarity and ambiguity, internal consistency, feasibility and attainability, and relation to educational processes and current educational trends.

As individual positions were clarified and revised, a project philosophy was developed. The philosophy included four areas of discussion:

1. A brief examination of the environmental problems and the reasons why action is necessary;

2. A justification for the role of the school in solving the problem;

3. A statement of the position and the purpose of the program; and

4. Clarification and defense of the position.

The philosophy statement which was developed is summarized in the following statement: "the necessity to develop in the individual the ability to think critically about man's relationship to the environment." The "Statement of Philosophy," dated February 22, 1972, was printed in the Interim Report #1. The rationale for selection of this position as quoted directly from the report, is as follows:

> "... a program that develops the intellectual capacities of its students, that is oriented toward critical thinking, has a better chance to succeed than one that depends upon the transportation from the mind of the teacher to the mind of each individual student a carefully worked-out, predetermined set of beliefs and actions regarding the environment which more than likely may not remain valid for each individual over a long period of time.
>
> "Because of constant changes in the condition of the environment and of knowledge in general, current beliefs and standards may not be applicable to future problems. Therefore, it seems a better course of action to equip the individual with the talent to develop his own position rather than require acceptance of a current position. The individual is more likely to accept positive values toward the environment if he has arrived at those values through the process of critical thinking than by accepting the values supposedly held by a teacher. Critical thinking requires the individual to do his own thinking. Positive results in society are more likely to happen if they come about because of individual action based upon critical thinking than upon a blind acceptance of values which one is told are right. If the school will improve the quality of learning and intellectual capabilities of students, then social problems have a chance of solution. In addition, in a society such as ours, one that permits as much freedom as it does, a purpose such as we endorse allows the schools to escape the charge of indoctrination. Better to train the individual in the process of critical thinking than feed him predetermined sets of beliefs, which he is to accept upon the authority of others.

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"In our judgment a critical thinker has certain characteristics. We understand that our biases may show, but because of the very nature of the program -- the development of critical thinking -- we recognize that our judgment is open to the very criticism that we are fostering, and we hope that it will become subject to the same inspection and examination as other facets of the environmental question. Among other things, the critical thinker looks for ambiguities in thought and fact. He is interested in the validity of facts and whether there is a cause and effect relationship between statements. In the process of learning how to think critically, the student must become aware of criteria that can be used for making judgments. Once having successfully completed a program of education based upon this philosophy, the critical thinker would then use the element of critical thinking in his own thought, not only about man's relationship to the environment, but also about all aspects of life.

"Critical thinking does not prevent the individual from thinking independently. It has been implied above that a definition of critical thinking will be determined by the project group. This, however, does not imply a doctrinaire approach, for we are allowing for the process of independent thought as well. To explain: we, by definition of our philosophy, accept the fact that on any environmental issue it is possible that different critical thinkers, after having been exposed to identical sets of critical processes, might arrive at different conclusions on the most appropriate course of action to solve the problem. Because of the nature of man's varied existence and the fact that there are so many situations that are not definitely black or white, as is certainly the case with environmental problems, the right of different critical thinkers to arrive at different, even opposing conclusions, has to be expected and accepted. Because we have stated an acceptance of this premise, it follows logically that we have respected the right of the individual to think independently as well as critically.

"In summary, our position is that the school can contribute to the solution of environmental problems. We further believe that the school can make its maximum contribution by developing a certain kind of individual, namely, one that arrives at his own views about the environment based upon his critical assessment of the issues which are involved."

This philosophy statement provided the basis for the development of the curriculum objectives to be discussed in Project Objective #2.

SURVEY AND ASSESSMENT OF AVAILABLE ENVIRONMENTAL RESOURCES

The purpose of surveying and assessing the available resources was to provide a collective and conscious listing of the environmental resources available from commercial publishers, government agencies, and non-profit educational and miscellaneous sources that could be of value to the teacher wishing to supplement the school curriculum with environmental materials.

Because there are literally hundreds of sources available, and because teachers do not have the time to review all of the materials, CDEC surveyed and assessed the large number of resources.

On December 7, 1972, running text copies of the "Annotated Catalog of Environmental Learning Resources" were delivered to the ESEA Title III office in Columbus and to Mr. Eugene Knight, Supervisor of Environmental Education, Ohio Department of Education (ODE). The publication contained the narrative text and photographs for approximately 200 environmental resources identified by CDEC.

CDEC provided only running copy as monies were not budgeted to print the resource catalog. The ODE assumed responsibilities for preparation of camera ready copy, publication, and distribution.

On November 1, 1973, copies of the catalog were available for schools in Ohio. Each school building was sent one copy. In addition, copies were sent to supervisors and administrators.

In order to evaluate the effectiveness and acceptance of the resource catalog, a contract was issued to Dr. Sheldon Gawiser, Director of the Center for Empirical Research, to conduct an evaluation between January and April of 1974. Dr. Gawiser prepared a questionnaire and contacted 250 classroom teachers from schools randomly selected from northeastern Ohio. The number of teachers from the schools were as follows:

School Types	Number of Teachers
urban	50
rural	50
non-public	50
suburban	100
TOTAL	250

The complete design and results were sent to the ESEA Title III office on April 22, 1974.

Regarding the results of the evaluation, Dr. Gawiser stated in his cover letter:

> "We are pleased to report that this evaluation is positive in almost every aspect. We have seldom, if ever, seen such a positive response."

Dr. Gawiser further states in his "Conclusions and Recommendations":

> "In a study of this type, we always seek to cross-tabulate key responses by other factors. However, for useful cross-tabulation, it is necessary that the responses be distributed on each variable in such a way that there is some variance to be explained, and some respondents in each category. This study does not allow for that type of analysis. However, the reason it does not is a pleasant one; the response is too uniformly positive. There is no question that this catalog is successful. The response to this product is more positive than any we have seen to any similar effort."

Quoting again from the report:

> "All of the relationships by grade level and by school type exhibited by these questions were tested for statistical significance. Only one relationship was significant at the .05 level. With the number of tables tested at least one relationship should be significant at the .05 level due entirely to chance. This lack of statistical significance is caused by the consistent approval of the catalog across virtually all groups.
>
> "The closed end questions cover the basic issue of user approval. Virtually all of the respondents, 97%, report that they would use the catalog to order materials. This would be sufficient to justify the existence of the catalog. About half of the respondents, 46%, report that they would order materials outside their discipline. The results of this question are difficult to analyze because respondents interpret their disciplines differently in terms of breadth. Obviously, a large part of the sample perceives that they would order materials outside their discipline."
>
> "If a catalog is to be worthwhile, it must be used, and used often. If it is difficult to use or is perceived to be difficult to use, then it will not serve the purpose. Virtually all, 99%, of the respondents find this catalog easy to use."

"It is also unlikely that a catalog will be used unless the divisions of the material are appropriate. Again, virtually all of the respondents, 99%, feel that the divisions of material are appropriate."

"The catalog will not be successful unless the indexes are easy to use. The response to this question is not as positive as the previous responses. Sixty-five percent feel the indexes are very useful, 26% feel that they are somewhat useful, and 8% see them as not useful. Some of the suggestions for improving the indexes can be found in the response to the open end question, "What suggestions for improving this resource catalog would you make?", infra."

Closely related to the indexes is the question "How useful would you say this catalog was in locating the resources you need?". The response is distributed in about the same proportions as in the index question. Again, the response is highly positive: 61% say very useful, 37% feel they are somewhat useful, and 1% see them as not useful. Suggestions to improve this facet of the catalog can also be found in the open end question analysis.

If the catalog was designed to change the teacher's concept of environmental education, it does not. At least, the teachers do not perceive it as having changed. Only 30% report that the catalog modified their concept, clarifying and/or expanding it. However, we believe that many of the teachers see this question as a test of their competence; i.e., if I am a good teacher, I already know all of this and therefore looking at the catalog will not change my concept of environmental education.

> "It is the duty of all teachers in the 70's to be acquainted with material of this nature." from a response to Question 7F.

Almost all of the respondents, 89%, want to receive an updated version of this catalog. The 6% who say they do not, give three reasons: 1) they are not very interested in environmental teaching; 2) they are interested but the school has no programs; and 3) they just don't have any money to purchase items. Thus, the real user base unanimously want a new version of the catalog.

The last close end question on the questionnaire requested the respondent to evaluate his own interest in environmental education. Seventy-three percent say they are very interested, while 26% report that they are somewhat interested in environmental education.

Even before the first resource catalog was printed, CDEC began development of a second catalog of environmental resources. Dr. Gawiser's evaluation overwhelmingly indicated the need and acceptance of the first volume, and provided the emphasis needed to support Volume II.

On March 12, 1974, running copy of Volume II of the resource catalog was sent to the ESEA Title III office in Columbus for examination and review. Volume II contained 325 resources not previously reported.

CDEC also maintained a resource library of books, pamphlets, audio-visual materials, games, teaching kits, and micro-fische for use by educators. Approximately 2000 titles are on file.

The resources have been very valuable in reviewing the types and content of environmental education materials. Many teachers borrow items for their instructional program. In addition, numerous telephone calls are received. An estimated 2000 inquiries were processed during the three years.

In summary, CDEC has been able to successfully complete the first project objective. Two resource catalogs totaling approximately 525 resources were developed. Evaluation of the first catalog was very positive.

Objective #2: To develop a set of instructional objectives for cognitive and affective areas of learner achievement, in conjunction with a survey of environmental education philosophies. The instructional objectives will provide a base of preparation and refinement for the scope and sequence program.

Today's trend in education emphasises the importance of the use of instructional objectives in educational strategies. Objectives serve as guidelines for persons involved in an instructional program, and CDEC accepted the need for developing instructional objectives to serve as curriculum guidelines.

A list of the criteria which CDEC used in development of the objectives are in Appendix II.

During the first year of the project, the staff prepared instructional objectives for the elementary curriculum. One set of objectives were included with eleven criteria developed by Dr. Robert Ennis, University of Illinois. The eleven criteria included judgment of:

1. Ambiguity
2. Contradiction
3. Whether conclusions necessarily follow
4. Specificity of statement
5. Applicability
6. Reliability
7. Warrantability
8. Assumption
9. Adequacy of definition
10. Acceptability of authority
11. Justification

These criteria were translated into objectives and reported to the ESEA Title III office on February 22, 1972.

In addition, five content objectives were developed around the PACID concepts (Patterns, Adaptation, Change, Interdependence, and Diversity) developed by the NEED Program, National Park Service, Department of the Interior. Refer to Appendix III for the PACID definitions.

During evaluation of the elementary program, it was determined that although the PACID concepts did provide an appropriate set of content objectives, the critical thinking criteria were not utilized by the teachers.

Teachers generally reacted by saying that they, in fact, were not teaching the critical thinking objectives in the lesson. The criteria were relatively academic and unfamiliar to teachers. Without extensive service training, it was felt the teachers would be unable to use the criteria.

After considerable thought and discussion based upon teachers recommendations as well as consultants and the CDEC staff, the decision was made not to include Dr. Ennis' eleven critical thinking criteria in the revised curriculum material. The PACID objectives were judged valuable and appropriate, and were included as objectives for the curriculum.

The secondary instructional objectives are as follows:

1. Introduction and exploration of major environmental points of view and philosophies.

2. Definition of the criteria to define a quality social, biotic, and physical environment; an examination of alternative life styles and the impact of environmental alteration on a quality of life; a focus on helping students develop a personal environmental philosophy.

3. Survey and interpretation of the socio-cultural community using sociological survey methods, and the bio-physical community using ecological survey methods to assess: community background, economics, government, politics, law enforcement, housing, education, recreation, health, communications, organizations and associations, carrying capacity, amounts and types of pollution, types and amounts of vegetation, habitats,

and population density of local animals.

4. Investigation into the problems revealed by the community inventory that deal with environmental management; emphasis on the wise planning, zoning and development of the community, and pollution standards and controls.

5. Examination of the political and economic realities of maintenance of the status quo or change for environmental betterment; emphasis on case studies and alternative types of action and their effectiveness.

6. Examination of strategies for dealing with a community problem through an investigation of available alternatives and their consequences; a skill and action unit dealing with strategies of change.

7. Review of futuristic view points leading to predictions of future life styles, technological advances, and systems; culminating with the designing of future systems that would provide a basis for survival.

All objectives are instructional, rather than behavioral. Instructional objectives are guidelines for the teacher to direct the teaching activities towards an identifiable goal. Behavioral objectives specify the conditions under which instruction is administered, the type of response a student is to demonstrate, and the success criteria.

Because of the great variety of students, teachers, and schools throughout Ohio, CDEC feels it is unjustified to specify the requirements of the behavioral objectives. Teachers are professionals who have received extensive training in teaching by objectives. They should be responsible for translating the instructional objectives into a behavioral outcome and determine type and level of acceptance.

Objective #3: To develop an interdisciplinary curriculum for grades K-12 that is keyed to the instructional objectives and resource list, and that has a flexible scope and sequence. The curriculum will be a teacher's guide, and will have alternative methods of approach to provide for the greatest flexibility of program.

A total of 64 units for teachers have been prepared, 34 at the elementary level, and 34 at the secondary level, with the following titles:

ENVIRONMENTAL LEARNING EXPERIENCES FOR KINDERGARTEN THROUGH SECOND GRADE

Planning for Seasonal Change: Fall

The Terrarium

Food Chains

Food Webs

Birds in our Lives

Trees

Trash

Dirt and Stuff

Kittens

ENVIRONMENTAL LEARNING EXPERIENCES FOR GRADES THREE AND FOUR

The School Lawn

The Vacant Lot

Giants on the Land: Trees in our Environment

The Endangered Predator

The Cemetery

Wild Ideas with Wild Plants

An Environmental Quality Index for the School and Neighborhood

Poetry in the Environment

The Breath of Life or Death: Air Pollution

Water

*Man's Adaptation

ENVIRONMENTAL LEARNING EXPERIENCES FOR GRADES FIVE AND SIX

Problem Solving

How to Plan a Clean-up Campaign in the Local Community

Animals and Their Habitat

Water: Life Blood of the Earth

Succession and the Pond Community

*Field and Forest Succession

*Soil and Erosion

Scars Upon the Land

Our Native Lands: Conserve and Preserve

Noise Pollution

*Minerals

*Weather and Climate

*Air Pollution (Part I)

*Air Pollution (Part II)

*INDICATES TITLES NOT PRINTED IN THE FINAL EDITIONS PUBLISHED BY THE OHIO DEPARTMENT OF EDUCATION

ENVIRONMENTAL LEARNING EXPERIENCES FOR JUNIOR HIGH SCHOOL

BIO-PHYSICAL DISCIPLINES

Earth Thoughts

Quality of Life

Environmental Inventory

Environmental Management

Community Problems

Futurism

ENVIRONMENTAL LEARNING EXPERIENCES FOR JUNIOR HIGH SCHOOL

SOCIO-CULTURAL DISCIPLINES

Earth Thoughts

Quality of Life

Environmental Inventory

Environmental Management

Politics and Economics

Community Problems

Futurism

ENVIRONMENTAL LEARNING EXPERIENCES FOR SENIOR HIGH SCHOOL

BIO-PHYSICAL DISCIPLINES

The six titles in this resource guide for teachers are the same titles as those for the junior high school package. The materials are more sophisticated, and are not repetitious of the junior high school units. The titles are:

Earth Thoughts

Quality of Life

Environmental Inventory

Environmental Management

Community Problems

Futurism

ENVIRONMENTAL LEARNING EXPERIENCES FOR SENIOR HIGH SCHOOL

SOCIO-CULTURAL DISCIPLINES

The seven titles in this resource guide for teachers are the same titles as those for the junior high school package. The materials are more sophisticated, and are not repetitious of the junior high school units. The titles are:

Earth Thoughts

Quality of Life

Politics and Economics

Community Problems

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Titles (Cont.)

Environmental Inventory	Futurism
Environmental Management	

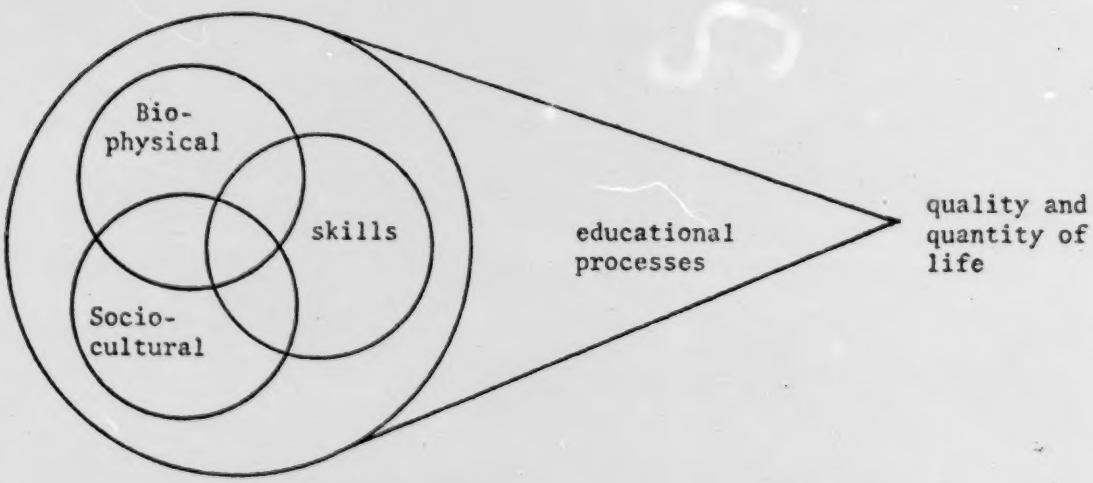
ENVIRONMENTAL LEARNING EXPERIENCES FOR JUNIOR HIGH SCHOOL AND SENIOR HIGH SCHOOL IN OTHER CURRICULUM AREAS

Junior High School	Senior High School
Art and Architectures	Art
Literature	Drama
Music	Leisure/Work
Leisure/Work	

Mathematics (Same unit for both levels)

In the first printing of the elementary curriculum guides by the ODE, seven titles were omitted from the package. The titles are indicated with an asterisk (*). During conversations with officials of the ODE, it was learned the titles were omitted for economic reasons, not because of unacceptable quality.

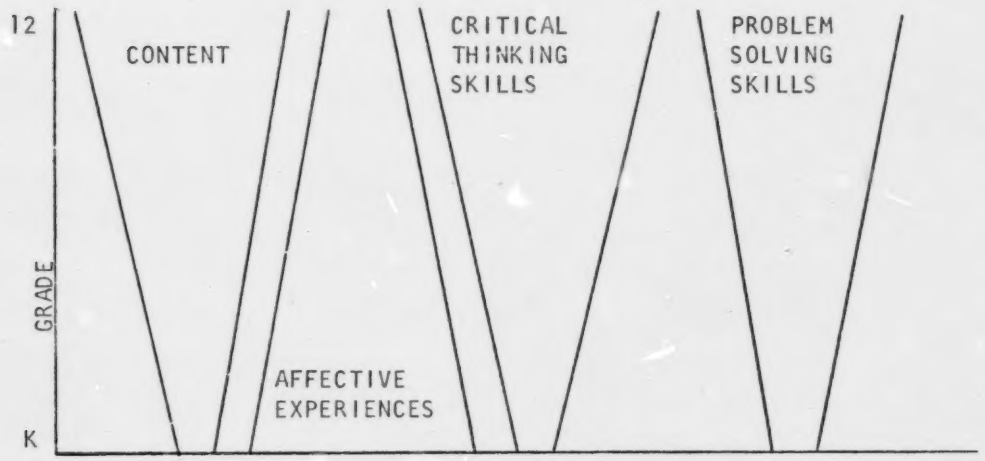
The components of the environmental curriculum developed by CDEC are interrelated as follows:



Adapted from: Marylynn Bowman, Ohio State University

The skills are primarily in the area of critical thinking and problem solving, both of which are important for the environmentally literate citizen. The bio-physical component is concerned with the ecological, physical, and chemical reactions that occur in a community, which includes man as a component organism. The socio-cultural component relates to the processes by which people relate to their environment, as their values and philosophies, and decisions. It is an ethical component by which man interacts with his environment.

For a program to be effective, there must also be an organizational strategy, which is illustrated as follows.



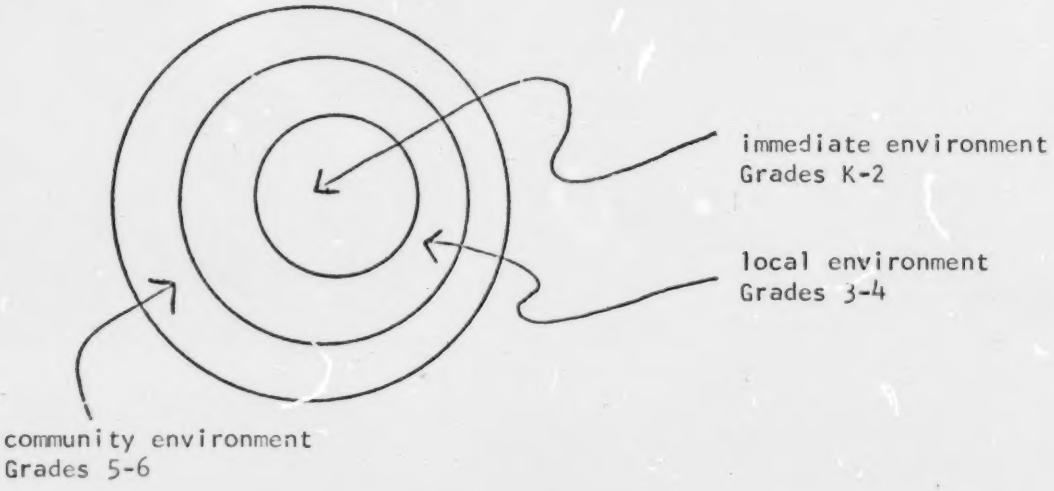
RELATIVE PERCENTAGE OF MATERIALS

Adapted from: Dr. William Stapp, University of Michigan

The major consideration at the Kindergarten level is providing direct and affective experiences with the environment. The child relates to the real world at his level and deals with one concept at a time.

By the time the student has reached grade 12, the units are concerned primarily with skills development and content.

The 34 elementary environmental units are organized into three packages for grades K-2, grades 3-4, and grades 5-6. The basis for this decision was made on the concept that expanding environments become more complicated, and that the complexity and abstraction of the materials must be closely related to the developmental level of the child. Following is an illustration of the concept as viewed by CDEC:



The first level, for grades K-2, is identified as the immediate environment. It is the environment that a student directly experiences in his immediate vicinity; e.g., one tree, one kitten, one terrarium. The materials are concerned with affective and direct experience.

The second level is for grades 3-4, and is concerned with the local environment which includes that which the student can directly experience by moving from one location to another; e.g., the classroom to the cafeteria; the school building to the school yard; the forest to the meadow. Students consider both individual members of the community as well as the total community organization.

Level three includes grades 5-6, and deals with the community environment. This environment may be a woodlot, a pond, a city block, or a town or city. Students directly experience portions of the material but they also have vicarious experiences through films or readings. The emphasis on the socio-cultural and bio-physical concepts increases. The skills of problem solving and critical thinking are also receiving additional attention in the materials.

As previously mentioned, the PACID concepts provided the organization for the elementary environmental units.

The PACID concepts were incorporated into the curriculum because the concepts are not specifically identified with any one subject area, but rather are universal in that they are found in natural and physical sciences, as well as the social sciences and humanities.

A second reason for the identification of the PACID concepts relates

to the ease of implementation by the elementary teacher. Elementary teachers have a tremendous job in that they often must prepare for several different subjects. If the environmental curriculum was centered around a separate type of content, this would require teachers to prepare for another topic. As it is, the PACID concepts are a method of looking, and an organizational pattern for more ecological and sociological concepts. In addition, use of the PACID concepts does not require a new vocabulary. It is felt the elementary teacher can learn to use PACID without intensive training.

It should be mentioned that the PACID concepts are closely related to one another and are not distinct and isolated concepts. An example for one of the concepts could very well be an example for another. Teachers should be aware that they need not identify distinct and isolated examples which are applicable to only one of the concepts.

The design of the secondary curriculum is as follows:

Socio-Cultural Discipline	Bio-Physical Discipline
Earth Thoughts	Earth Thoughts
Quality of Life	Quality of Life
Environmental Inventory	Environmental Inventory
Environmental Management	Environmental Management
Politics and Economics	
Community Problems	Community Problems
Futurism	Futurism

This design is for both the junior high school and the senior high school. The senior high school units are not repetitious of the junior high school units, but rather built upon the concepts in a more complex and sophisticated approach.

Additional units are included in other curriculum areas as follows:

Junior High School	Senior High School
Art and Architecture	Art
Literature	Drama
Music	Leisure/Work
Leisure/Work	

Mathematics (Same unit for both levels)

Although the environmental units in the Bio-Physical and Socio-Cultural Disciplines are designed to be sequencial, they also have the capabilities to stand alone. Thus, the curriculum can be used as separate curriculums, supplementary materials, or as a complete mini course. They are to be designed for use in interdisciplinary programs or within a single discipline.

Many schools are not in a financial position to hire consultants, purchase expensive equipment, or schedule numerous field trips from the school site in order to implement an environmental curriculum. The grades K-12 environmental curriculum materials were developed for the classroom teacher who will have the major responsibility of providing an environmental experience to the student in the class. For this reason, all materials received considerable input from classroom teachers.

Only a minimum amount of equipment is required and most of that should be available in any school. Field experiences outside of the classroom are usually within the vicinity of the school and its immediate neighborhood. Whenever expensive equipment or long distance field trips are required, the activities are classified as optional.

Extensive evaluation was conducted on both the elementary and secondary curriculum materials. The evaluation efforts were divided into two phases. First, data was collected on the first draft materials for the purpose of improvement of the quality. Classroom teachers piloted the materials in their classroom to determine teachability and applicability; and a jury of educational experts validated the content. The impact by the first jury was used to revise the materials and prepare the final curriculum guides. A second jury was then contracted to determine potential success of each unit in the revised and final form.

The sequence for these evaluation processes was as follows:

	Elementary Curriculum	Secondary Curriculum
Piloting of first draft units by classroom teachers	October 7, 1972 to February 15, 1973	February 2, 1974 to April 4, 1974
Review of first draft units by first jury	January 7, 1973 to February 15, 1973	February 25, 1974 to March 15, 1974
Revising of first draft units	February 16, 1973 to May 1, 1973	April 5, 1974 to May 1, 1974
Review of final copy of units by second jury	April 1, 1974 to June 20, 1974	June 1, 1974 to June 30, 1974

Because the review of the final copy of the curriculum materials by the second jury is the best indication as to the potential success of the materials, this evaluation process will be discussed in further detail. Persons interested in additional information on the pilot program or the review by the first jury should refer to other reports. The discussion of the elementary program is reported in the "Summary of the Pilot, Evaluation, and Revision of the Elementary Curriculum Materials," a supplemental report to the second continuation application submitted to the ESEA Title III office in Columbus on June 14, 1973.

The final jury review of the elementary materials was submitted on November 14, 1974, in a supplemental report to this publication, and was entitled "Report of the Evaluation of the Environmental Curriculum Materials for Grades Kindergarten Through Six".

The report entitled "Summary of the Development, Pilot, Revision, and Evaluation of the Secondary Curriculum Materials" which was submitted to the ESEA Title III office in Columbus on August 14, 1974, discusses in detail, the process of development and evaluation of the secondary curriculum materials. The results of the final jury review of the final copy secondary curriculum materials are also included in this report.

The secondary jury for both the elementary and secondary curriculum materials was composed of teachers who had piloted the materials, teachers who had never had formal contact with CDEC, school administrators, curriculum and instruction experts, and environmental education experts. The composition of the secondary jury is as follows:

Number of Reviews by Position

	Elementary Curriculum	Secondary Curriculum
Pilot Teachers	20	15
Non-Pilot Teachers	32	20
School Administrators	5	11
Curriculum and Instruction Experts	5	11
Environmental Education Experts	5	11
Total	67	68

Each reviewer was to complete one questionnaire for each unit to be evaluated. The questionnaire contained a list of twenty questions to be rated between 1 (Strongly Agree) and 7 (Strongly Disagree). Using this system of rating, it is possible to obtain an average score for each unit for each reviewer. The questionnaires for the elementary and secondary juries were basically alike. One noticeable exception relates to question #21 on the questionnaire for the elementary jury. This question requests an overall reaction of the reviewer to the unit, a rating of excellent, good, fair, or poor. Copies of the two questionnaires are presented in Appendix IV.

By obtaining an average response for each unit from each reviewer, it was possible to obtain a single numerical average for each title. This numerical average offers a simple method of obtaining data as to the quality of the unit.

For the elementary and secondary curriculum units, the following criteria were established for minimum level of acceptance:

1. The total average response of all people reviewing a unit must be between 1.00 and 3.00.

2. Two-thirds of the individual responses of all people reviewing a unit must be between 1.00 and 3.00.

In addition to the two above criteria, the elementary evaluation had one additional criteria:

3. Two-thirds of all verbal responses from question #21 for a unit must be either excellent or good.

Scores were computed for each of the 64 titles. For example, the numerical average of all persons reviewing the unit "Preparing for Seasonal Change: Fall" was 1.91. This figure was calculated by obtaining an average response for each reviewer, and then calculating an average response for all reviewers. Related to criteria #2, 96.9 percent of the ratings provided by the 32 reviewers were between 1.00 and 3.00, with only one person rating the unit between 3.01 and 7.00. For criteria #3 used for elementary units, 93.8 percent of all ratings of question #21 were either excellent or good.

For the unit "Earth Thoughts, Bio-Physical, Junior High School", the average response of all reviewers was 1.97. Of the jury members who reviewed the unit, 94.7 percent rated the unit between 1.00 and 3.00 indicating the unit was of acceptable quality.

The results of the elementary and secondary evaluations are presented in Appendix V.

For the elementary units, 31 units or 91.2 percent of the units successfully met all three criteria. Two units (Food Webs, grades K-2 and Pond Succession, grades5-6) successfully met criteria #1 and #2, but did not meet criteria #3. The rating for criteria #3 for Food Webs and Pond Succession was 56.3 percent and 61.3 percent respectively. One unit (The Endangered Predator, grades 3-4) successfully met criteria #1, but not criteria #2 and #3. The results for criteria #2 and #3 were 60.0 percent and 37.9 percent respectively.

For the secondary units, 100 percent of the units successfully met the minimum level of acceptance of the two criteria. The range of the unit averages was between 1.41 and 2.64. Twenty-five units (73 percent) fell within the 1.00 to 2.00 range while the remaining 9 units (27 percent) fell within the 2.00 to 3.00 range. In all cases two thirds or more of the jury members rated each unit within the acceptable range.

In conclusion, 61 (95.3 percent) of the 64 units developed by CDEC met the minimum level of acceptance. These results indicate that the objectives to develop an environmental curriculum for grades K-12 has been successful.

The Ohio Department of Education, who assumed responsibility for publication and distribution of the elementary curriculum units, omitted seven units from the final printed package of Environmental Learning Experiences, grades K-6. Further analysis was conducted to determine if there was a difference between the quality of the units included in the package as compared to the units omitted. Appendix VI reports the comparisons.

For the one unit (Man's Adaptation) omitted from the package for

grades 3-4, the unit was found slightly less acceptable than the ten printed units. As can be seen from the data, the teachers evaluated this one unit equal in quality to the other ten units, whereas the non-teachers indicated it was of substantially lower quality than the others. This lower rating by the non-teachers is the reason for the overall lower rating.

The same analysis was conducted for the six units omitted from the Environmental Learning Experiences for grades 5-6. The average ratings for these omitted units were almost the same as the average ratings for the eight units included in the package. Teachers evaluated the six omitted units slightly higher quality than the eight units included in the package, whereas the not-teachers rated the six units equal to or slightly lower quality.

In conclusion, the omitted units are of about equal quality as those printed, and that their omission from the printed package should not imply unacceptability. In the event of future printings of the elementary curriculum materials, it is suggested that the seven unpublished titles be included in future editions.

> Objective #4: To develop criteria for measuring instructional progress of students and teachers in regard to finalization of the instructional objectives in Objective #2. The criteria will serve as guide revision data, and a possible instrument for statewide assessment.

Due to the emphasis on accountability and the need to demonstrate a learning success in children involved in programs, CDEC developed criteria for measuring student learning. During the first year of the project, it was learned that few instruments were available that were applicable to environmental education. Thus, it was necessary to develop our own instruments.

A nationally known expert on testing and evaluation, Dr. Bertram Masia of Case Western Reserve University, was contracted to assist in the development of an instrument to be administered to students.

CDEC staff members met with Dr. Masia on numerous occasions between June, 1972, and February, 1973, concerning the instrument. CDEC provided Dr. Masia with a complete set of the environmental units as a basis for unit development. From that basis, Dr. Masia developed three cognitive instruments focusing on the PACID concepts, one each for grades K-2, 3-4, and 5-6. Dr. Masia developed three affective instruments for the same grade ranges. The purpose of the affective instrument was to determine an environmental attitude index for elementary students.

Copies of both the three PACID instruments and the three affective instruments were sent to the ESEA Title III Office on May 1, 1973, for examination and review.

In order to field test both instruments, Dr. Sheldon Gawiser of John Carroll University was contracted. On March 16, 1973, Dr. Gawiser met with members of the CDEC staff to clarify the role of Dr. Gawiser in the testing administration.

From that meeting, the objective for the student instrument is defined as follows:

> The objective of the student instrument is to measure the instructional progress of students in contact with CDEC material. This student achievement is based upon the learning that has taken place of the PACID concepts. The Affective Instrument is concerned with establishing an index of environmental interests and attitudes.

Dr. Gawiser was contracted to administer, analyze, and report the results of the field testing of the instruments:

Grades K-2	PACID and Affective
Grades 3-4	PACID and Affective
Grades 5-6	PACID and Affective

The instruments were to be administered about May 13, 1973, and the results returned to CDEC on June 15, 1973.

Dr. Gawiser administered the tests to approximately 926 students. Students of 30 classrooms previously involved in the pilot program were involved in the testing. Six classrooms in grades K-2 who had no previous involvement in the pilot program served as control groups. No controls were identified at grades 3-4 or grades 5-6.

A copy of Dr. Gawiser's report was sent to the ESEA Title III Office in Columbus on June 18, 1973 for examination and review.

The results of the PACID tests indicated certain sections needed revision, particularly the K-2, "Change" section. Overall, the tests appeared reasonably successful, and with revision and deletion of specific items, the tests could be successfully administered.

Affective Tests are difficult to construct because of the subjective standards of the instrument. To quote from Dr. Gawiser's report:

> "There are some aspects of the Affective Test which present potential problems and should be mentioned at this time. To begin with, there are inherent difficulties encountered from

a statistical standpoint when one attempts to qualify subjective information. The Affective tests are highly subjective instruments. The students' attitudes relating to the environment are judged based on a set of subjective standards held by the author or authors of the Affective Instruments. Many factors may enter into the development of an attitude. Because of their subjective nature, caution must be exercised in the use and interpretation of the Affective tests."

Dr. Gawiser was concerned with the reliability of the test items, and thus, made no attempt to analyze the items for validity. In order to deal with this validity factor, five environmental experts from Ohio and area states read and commented on both the PACID and Affective Instruments. The consultants were:

Dr. William M. Gordon, Associate Professor
School of Education
Miami University
Oxford, Ohio

Dr. Clifford Knapp, Science Director
Ridgewood Schools
Ridgewood, New Jersey

Dr. Robert E. Roth
Associate Professor of Environmental Education
Department of Natural Resources
Ohio State University
Columbus, Ohio

Dr. William B. Stapp, Program Chairman
Environmental Education and Outdoor Recreation Program
School of Natural Resources
University of Michigan
Ann Arbor, Michigan

Dr. Malcom D. Swan, Professor
Department of Outdoor Teacher Education
Northern Illinois University
Oregon, Illinois

Each of the experts received copies of the three PACID tests on March 22, 1973, in the exact form as received from Dr. Masia.

Generally, the original PACID instruments were found to lack suitable directions to guide the teacher in test administration. Extensive reorganization was needed to clarify the direction. For several test items, suggestions were made regarding a better alternative answer. There was some concern as to the relation of the test to the specific

PACID concepts. Revisions, based upon comments from the experts, were made prior to field testing.

Upon receipt of the Affective Instrument from Dr. Masia, copies were sent to the experts for review. Because Dr. Masia sent the instrument at a date later than originally requested, and because CDEC wanted to field test the Affective portion with the PACID portion, it was necessary to print the instrument as received from Dr. Masia. Therefore, none of the comments from the experts were incorporated into the field edition.

An affective inventory is extremely difficult to construct in that the values of the developer are incorporated into the instrument. All the reviewers indicated this in their letters. Three felt the tests were of merit and could be used. Two indicated the instrument was off basis, and required extensive revision.

After considerable discussion between CDEC and the ESEA Title III Office, it was decided not to continue development of instruments to determine the impact of the curriculum materials on students. Rationale for this decision is:

1. cost and expense of instrument development
2. cost and expense of field validation and testing
3. difficulty in obtaining a reliable and valid instrument
4. inability to specify the type and quality of student experiences

Item number four needs further discussion. All of the curriculum materials are designed for teacher use rather than student use. The teacher implements the environmental program based upon the suggestions in the teachers' guide. Thus, the type and quality of instruction received by the student is affected by the teacher. There would be no way of standardizing teacher presentations so as to standardize the experience of the students. If the curriculum materials were for student use, it can be assumed that the message was the same, although reaction of the students to the message would vary.

Objective #5: To produce copyright materials which include current philosophical concepts pertaining to environmental education, the instructional objectives used in program development, the guides for the interdisciplinary curriculum for grades K-12, the survey of resources, guides for conducting inservice workshops, the evaluation instruments developed during the program, and six-month interim reports (February and August). All of the materials will be suitable for submission to the ERIC Center, Division of Environmental Education, for cataloging. The final materials will be available August, 1974.

It was originally thought that copyright should be used to protect the materials produced by CDEC. During the first grant year, it was decided by members of the ESEA Title III Office, ODE staff, and CDEC staff not to copyright materials. A letter from Mr. Richard Dragin, dated March 3, 1972, supported the decision.

Objective #6: To conduct inservice workshops designed to assist in the implementation of the environmental curriculum in individual school programs through the motivation of and behavioral changes in teachers and administrators.

The objective stated above is the objective as stated in the original grant application. This objective has been revised several times in order to meet the changing needs of the project.

During the first year of the project, the objective was rewritten to provide additional specificity for project activities. The revised objectives prepared during the 1971-1972 project year is:

To sponsor inservice workshops and leadership conferences with purposes to specific participants and objectives and time as follows:

A. Project staff: Workshop for knowledgeability and skills pertaining to:

1. Writing of instructional objectives - November, 1971
2. Unit writing - March, 1972
3. Curriculum organization - August, 1973

B. Cooperating school teachers

1. Purposes:

a. Affective attitudinal changes of teacher pertaining to environmental education
b. Knowledgeability and skills pertaining to guide use
c. Instructional techniques for environmental education

2. Time Schedule

a. Grades K-6: September, 1972
b. Grades 7-12: January, 1973
c. Grades K-6: September, 1973

C. Administrators, Curriculum Specialists, Key Teachers: Leadership Conference

1. Purposes:

   a. Affective changes of attitude toward valuing environmental education as a priority item in school programs
   b. Behavioral changes pertaining to program implementation

2. Time Schedule

   a. May, 1972
   b. May, 1973
   c. Summer, 1974

At the completion of the second project year, the objective was further revised. The objective as stated in the second continuation application to be used during the 1973-1974 project year is:

To sponsor inservice workshops and leadership conferences with purposes to specific participants and objectives and time as follows:

Participants - cooperating school teachers

Purpose - a. Affective attitudinal changes of teacher pertaining to environmental education.
b. Knowledgeability and skills pertaining to guide use.
c. Instructional techniques for environmental education.

Time Schedule - September, 1972 for grades K-6
January, 1973 for grades 7-12

The original objective specified workshops for three groups: project staff; teachers in pilot schools; and administrators and curriculum specialists. In order to better understand the activities which resulted from this objective, each year will be discussed individually.

FIRST PROJECT YEAR - 1971 - 1972:

Project staff was involved in workshop programs during the first year of the project. Consultants from Miami University, Oxford, Ohio, and Case Western Reserve University (CWRU), Cleveland, Ohio, were contracted to prepare project staff for their roles in the curriculum

development process. Workshops were conducted between October 26, 1971 and April 3, 1972.

A "Booster Conference" sponsored by CDEC on March 16-17, 1972 for the purpose of gathering information on operational programs throughout Ohio also served as a trial run for the leadership conference which was scheduled in the Spring, 1972. Mr. John Thompson of the Environmental Studies Program, Boulder, Colorado, was contacted to make two major presentations, and also to talk with staff members concerning conference techniques. The Environmental Studies program sponsors numerous workshop sessions for all levels for educators.

The logistical arrangements of meals and rooms, and of conference organization were carefully planned, and no major difficulties developed. The experience provided confidence for the CDEC staff as they prepared for the leadership conference.

Leadership conferences were conducted during the first project year to encourage the implementation environmental education program. The decision was made in January, 1972 to invite central office administrators to the conference. It was determined that these policymakers must be committed to a program before it could be implemented into their schools. Thus, the invitation was to be extended to superintendents, assistant superintendents, and school board members.

The purpose was as follows:

1. To inform participants as to the parameters of environmental education.

2. To assist in the development of skills necessary to implement environmental education programs into local school situations.

3. To provide information regarding the state plan for environmental education and the role of CDEC in the state plan.

During the planning of this conference, many people were contacted to provide input into the program. People assisting the CDEC staff were: Mr. Eugene A. Knight, Supervisor of Environmental Education, Ohio Department of Education (ODE); Dr. James Pelley and Dr. Orval Conner, School of Education, Miami University; Mr. Wilbur Miller, Dr. William Deighan, and Dr. Warren Craigo, central office administration, Willoughby-Eastlake City Schools. Additional school personnel from public schools and colleges and universities were also solicited for comments.

In an effort to involve as many administrators as possible and to maintain a small group for the ease of communication with individual participants, five regional conferences were planned, based on the regional plan of the Ohio School Boards Association. Administrators were encouraged to attend the conference in their area. All lodging and meal expenses were paid by CDEC.

The regional conferences were two days in length, at the following locations:

April 17-18	Punderson State Park	Northeast Region
April 24-25	Burr Oak State Park	Southeast Region
April 27-28	Hueston Woods State Park	Southwest Region
May 1-2	Holiday Inn; Perrysburg	Northwest Region
May 4-5	Ramada Inn East; Columbus	Central Region

During the five conferences, 182 school districts were represented with a total of 193 people in attendance. Superintendents numbered the largest single group of participants, totalling 102 (56 percent). The remaining participants were largely assistant superintendents, curriculum directors, and principals. Hueston Woods was the largest conference with 50 participants; Ramada Inn East and the Punderson State Park were next with 42 participants and 40 participants respectively.

The information gathered by CDEC from the conferences was of great importance in planning both the curriculum and the implementation. Although many views were expressed concerning the types of curriculum that should be prepared, the general opinion of the majority of participants reinforced the position outlined in the original grant application, that the curriculum should be continuous for all students in all disciplines in grades K-12.

Because the number of the participants was kept small by design, it was possible to talk individually with many school leaders, both in formal and informal discussions. A major concern among administrators is the recent mandates for education in special topic areas as environmental education and drug education, and the increasing pressure to become involved in social problems without realistic plans and adequate financial arrangements. If the Ohio Department of Education desires these areas of concern to be taught in the schools, adequate assistance must be provided.

A formal questionnaire was distributed to participants at the close of the conferences. From the 117 questionnaires returned, the conferences were rated as being successful for the participants. The overall evaluation averaged 7.8 on a base of ten; Burr Oak State Park was the

highest rating with 8.6, and Punderson State Park the lowest with 7.2.

In response to the question of whether environmental education was a major mechanism for resolution of the problem, 75 responses strongly agreed, 39 moderately agreed, and 1 slightly agreed. No disagreement was expressed. As to the relation of the school in resolution of the environmental problems, 74 strongly agreed as to this role for the school, 38 moderately agreed, and 7 slightly agreed.

The Leadership Conferences were truly valuable learning experiences in that the CDEC staff had a better understanding of the problems of school administrators. In addition, school personnel became informed as to the definition of environmental education, of the curriculum being developed.

The original objective scheduled leadership conferences for the second and third years of the project. A tremendous amount of time was required to plan and conduct these five conferences, and it became apparent that the time requirement severely hampered CDEC towards the attainment of its goal. Thus, the Leadership Conferences scheduled for other years were cancelled.

SECOND PROJECT YEAR - 1972 - 1973:

The major activity related to Objective #6 during the second project year related to the training of teachers involved in the piloting of the elementary curriculum materials.

Objectives of the workshop were:

1. Present CDEC's view of environmental education and to inform the teachers as to their role in the curriculum development process.

2. Assist teachers in planning for the implementation of the pilot units into their existing curriculum.

3. Provide skills and techniques necessary to implement the pilot units.

4. Clarify questions and concerns expressed by teachers.

The workshop was held on September 30 and October 7, 1972 at Jefferson Elementary School, Willoughby-Eastlake City Schools. The 69 teachers which attended represented the socio-cultural communities previously discussed.

Mr. Eugene Knight, Supervisor of Environmental Education for ODE was present to welcome the teachers on behalf of the ODE. Dr. Richard Derr, School of Education at CWRU presented a session on critical thinking during the afternoon session on September 30. The CDEC staff presented the rest of the presentations. Dr. Eugene Bartoo, also of CWRU, was in attendance throughout the two days as official evaluator.

Dr. Bartoo's report was completed November 22, 1972. A copy of the report was sent to the ESEA Title III Office on December 4, 1972. In summary of Dr. Bartoo's report, the workshop was more of a conference than a workshop. CDEC personnel and the attending consultants made seven presentations, of which four were in the form of lectures rather than discussions. Two work sessions were scheduled where teachers became involved in activities. More informal discussions and work sessions would have been more beneficial to the teachers. Further detail can be obtained by referring to Dr. Bartoo's report.

The CDEC staff noted a strong desire on the part of the pilot teachers to meet with each other and exchange ideas and problems concerning use of the pilot materials. Although this was not an identify program for this year, the decision was made to sponsor such a meeting if the teachers and CDEC could both benefit from it. A questionnaire was mailed to the pilot teachers on November 3, 1972, to determine the degree of interest and possible time for such a meeting. As a result of the quedtionnaires, a follow-up letter was mailed to the pilot teachers on December 7, 1972, announcing a dinner meeting to be held on Tuesday, January 16, 1973, at the Hospitality Inn in Willoughby.

A total of 47 teachers assembled at the Hospitality Inn at 5:30 P.M. for dinner. A welcome and introduction to the meeting was given by project director, Dennis Wint. The pilot teachers were seated at separate tables by grade level. Informal discussion sessions started at 7:00 P.M. A CDEC staff member was present at each table to facilitate discussion and record the comments and criticisms of each group. At this time, a mid-pilot survey form was distributed and time given the pilot teachers to respond. The questionnaire was designed to elicit general teacher feelings toward the pilot program and the materials. It was interesting to note that out of the 47 surveys compiled, 30 teachers felt that environmental quality is one of the biggest problems facing our nation today, with 7 neutral and 1 disagreeing.

Excitement and enjoyment seemed to run high as witnessed by these varied comments:

The most exciting experiences we did were:

1. outdoors!
2. walks in the woods discovering different kinds of trees.
3. interviewing persons on school environment.
4. making Haiku books.
5. field trips in our playground with a new view.

My class had the best time when we:

1. went 'bear hu[illegible]ng' for caterpillars.
2. made mud balls.
3. wrote Haiku.
4. went to the cemetery for the tombstone rubbings.
5. outdoors - even in the mud.
6. went outdoors to test the teacher's car for air pollutants.

The informal discussion session was followed by an audio-visual presentation designed to acquaint the teachers with the type of materials available from CDEC. The comments of the pilot teachers during the informal discussions were recorded and summarized by the CDEC staff. Most of them were related to suggestions for improving the quality of the K-6 units.

In order to accelerate the process of revising the K-6 units, twenty-one pilot teachers were invited to participate in a two day revision workshop scheduled for March 12-13, 1973.

An effort was made to have representatives from the five socio-economic communities. Prior to the revision workshop, the teachers read and evaluated the units they would be working on. Written contracts were mailed to each participating teacher prior to the workshop.

The workshop began on Monday, March 12, 1973, at 8:35 A.M. The workshop teachers were welcomed by project director, Dennis Wint,

and the workshop schedule was explained. The first working session began at 8:45 A.M. It became evident during the first session that the teachers had fully prepared for the workshop. Each had reviewed and made comments on each of their assigned units. The working sessions at the conference were an hour and a half in length. The workshop teachers were divided into five groups, each led by a different CDEC staff member and each considering a separate unit. Originally the staff had been concerned about handling a large number of units in the short time allotted. It became evident though, that due to the preparation of both the workshop teachers and the staff, that a small group handling a unit in one hour and a half was adequate. Objectives, directions, content, activities, illustrations, and background materials for each unit was discussed in detail. Additions and deletions of content were made, and some units reorganized to provide a more logical sequence. Many of the practical problems encountered in the classroom by the teachers were noted and discussed. Ideas and activities were generated by the group to obviate these problems. The workshop proceeded very smoothly with all of the units being covered on schedule. The staff considered the workshop very successful and felt that for the purpose of revising the units, the additional input from the pilot teachers was timely and worthwhile.

CDEC was progressing on schedule with the piloting of the elementary units when a telephone call was received from the ODE regarding the progress and the possibilities of advancing the schedule for revision of the elementary units. The ODE anticipated surplus monies which could be used for the publication and distribution of CDEC's elementary units.

On February 14, 1973, a meeting was held in Columbus to discuss the possibilities of advancing the schedule. After discussion from that meeting, CDEC proposed a schedule in a letter to Mr. Warner Moore, ODE, and Mr. Franklin Scott, ESEA Title III Office on February 14, 1973, which anticipated completion of the materials by May 1, 1973.

Due to the accelerated time schedule for the completion of the elementary curriculum materials, the development and piloting of the secondary materials, and the workshop originally scheduled for secondary teachers for January, 1973, were cancelled.

THIRD PROJECT YEAR - 1973 - 1974:

Because of completion of the elementary curriculum materials during the second project year, workshops for elementary teachers as originally proposed were no longer necessary. Thus, CDEC turned its full energies towards development and evaluation of the secondary environmental curriculum.

The several workshops sponsored during the final grant year were:

October 6, 1973	Writers Workshop for 38 consultants contracted to prepare the secondary curriculum.
February 2, 1974 and February 14, 1974	Pilot Teachers Workshop for teachers field testing the secondary curriculum.
March 30, 1974 and April 4, 1974	End-of-the-Pilot Workshop for all of the pilot teachers.
April 19-21, 1974	Revisors' Workshop for the 34 writers and pilot teachers contracted to revise the secondary curriculum.

Each of the four workshop sessions will be discussed individually to provide specific information as to the orientation and success.

WRITERS' WORKSHOP

A successful writers' workshop was held on October 6, 1973, at the CDEC office and the Technical Center in Willoughby, Ohio. Thirty-one prospective writers plus CDEC staff and guests attended the all day workshop. Following registration and coffee, a brief introduction was given by the director, Dennis M. Wint. A discussion of the curriculum design and its ramifications was held followed by some practical writing considerations and guidelines given by Dr. Peter Gail of the Institute for Environmental Education, Cleveland, Ohio. Following lunch, the writers had the opportunity to meet with writers preparing related topics. During these meetings, all writers in one topic area, as Quality of Life, discussed problems as unit content, sequence, and scope. A question and answer period and wrap-up followed at which time the workshop was concluded. An evaluation of the writers' workshop was conducted by Dr. Eugene Bartoo, Assistant Professor of Education at Case Western Reserve University. Dr. Bartoo's evaluation stated that:

1. The participants were provided with a comprehensive writers' packet of information which they received prior to the workshop. This packet gave the writers background information so the workshop time could be spent more effectively.

2. The scheduling of large and small group meetings was sound.

3. Varied activities and movement was provided to keep the participants active and involved.

4. The workshop setting was adequate and the use of the CDEC offices, while a bit cramped, offered the writers an opportunity to use the CDEC resource library.

PILOT TEACHERS' WORKSHOP

The objectives of the workshop for pilot teachers were:

1. organization, background, and philosophy of CDEC materials

2. ourpose of the CDEC secondary curriculum, the importance of the pilot progran, and role of the pilot teacher

3. discussion of the concepts covered in the curriculum and units

4. methods of implement of the units into classroom situation

The pilot teachers workshop was held on February 2, 1974, at South High School, in Willoughby, Ohio. Seventy-five pilot teachers were in attendance. A winter snow storm prevented numerous other pilot teachers from attending.

The welcome presented by Dennis M. Wint was followed by selected words from Mr. Eugene A. Knight, Supervisor of Environmental Education, ODE. The curriculum design, explained by Susan M. Zacher, was followed by Mary R. Junglas who discussed the use and importance of the pilot evaluation forms.

The pilot teachers then attended the first of two discussion-demonstrations concerning the pilot units. During these meetings, the pilot teachers read and reviewed their units, discussed implementation techniques, and observed a demonstration or example of activities in the units. Following lunch, the pilot teachers met with their CDEC contact person for the collection of information forms and to schedule a progress meeting.

A second pilot teachers meeting was held for teachers in the Columbus City Schools in Columbus on February 14, 1974. An abbreviated but similar agenda was followed at this workshop.

Attendance at both workshops was excellent, and from the comments, the participants felt the workshop was interesting and worthwhile.

THE END OF THE PILOT WORKSHOP

The workshop was scheduled for March 30, 1974 at South High School in Willoughby, Ohio. A similar workshop was also planned for our pilot teachers in Columbus and it was held in Columbus, Ohio on April 4, 1974.

The purpose of the end of the pilot meeting was:

1. To allow time for completion of all unit, experience, and activity evaluation forms, and an activity evaluation form distributed at the workshop.

2. To provide an opportunity for the pilot teachers to collectively discuss the strengths and weaknesses of each of our pilot units during small group working sessions. A form was provided on which each group summarized their reactions and suggestions.

The purposes of the workshop were accomplished and valuable input and evaluation data was collected.

REVISION WORKSHOP

The Revision Workshop was held April 19-21, 1974 at Saw Mill Creek, Huron, Ohio. Upon arrival, each revisor was given an information packet. During the first evening session, each revisor met with one of his discussion groups to revise a unit assigned to them. Two more discussion groups were held on the morning of April 20. The discussion groups were planned to help the revisor outline the areas in the unit needing revision and to provide an audience with whom weaknesses and changes of the unit could be discussed.

After the discussion sessions, revisors began rewriting their unit. All revisors were to be completed by 12:00 P.M., April 21.

The CDEC staff worked closely with their revisors, aiding in the discussions, helping to write difficult sections, searching for appropriate bibliographic materials and generally keeping things moving smoothly.

The CDEC staff was very pleased with the revision workshop. The revisors were serious hard-workers and by 12:00 P.M. on April 21, all the units had been revised. Because the revisors were familiar with the format design and requirements, very little editing and rewriting was required by the CDEF staff.

G. DISSEMINATION

In the original grant application, one project objective related specifically to dissemination activities; the sponsoring of leadership conferences. During discussions with the ESEA Title III consultant in Columbus, during the 1971-1972 grant year, it was decided that extensive dissemination was inappropriate for the project. The rationale was based upon the limited time available for development of the materials. The time spent on leadership conferences was better spent in the development process.

During the second and third grant years, CDEC's dissemination was limited largely to pilot teachers and educators closely associated with the project.

In order to inform pilot teachers of the process of CDEC's curriculum effort, a newsletter was initiated. Monthly issues were sent to all pilot teachers, professional personnel of the contract school, and other interested persons.

The ESEA Title III Office in Columbus suggested that CDEC prepare a visual display to be used in conjunction with educational meetings and programs throughout Ohio. CDEC contracted a display with COMCEPT, INC. of Columbus at a cost of approximately $1200.00. The display was used on numerous occasions in conjunction with the Ohio ESEA Title III dissemination effort. In addition, CDEC used the display with local dissemination activities.

The Ohio Department of Education, through Mr. Eugene Knight, sponsored fourteen environmental education workshops for Ohio educators between January and May, 1973. Although CDEC did not directly participate in these workshops, CDEC did provide a slide program, illustrating the PACID concepts and the critical thinking criteria for use in the workshops. The slide program was specifically related to the elementary curriculum materials. In addition, CDEC provided 1200 sample units for distribution to workshop participants.

During the second project year, it became obvious that slide/tape presentation was needed to fulfill the numerous requests for presentation about the project. Monies were allocated in the third project year to contract with an audio-visual agency to prepare such a presentation.

Working closely with CDEC, Creative Copy, Inc. prepared a 12 minute presentation about CDEC and the curriculum materials. The presentation had approximately 80 slides and was narrated.

During the spring and summer, 1974, CDEC was involved in numerous

presentations to schools interested in the Adaptation Grants, a special implementation effort sponsored by Ohio ESEA Title III. Approximately 35 presentations were made to approximately 500 people.

Because CDEC is a developmental project, a very limited number of dissemination programs were conducted. During the three years of the project, approximately 75 presentations were made, not including presentations previously mentioned. Approximately 25 presentations were made during the third project year, 1973-1974.

H. CONCLUSIONS AND RECOMMENDATIONS

Based upon the original objective of CDEC, the development of an environmental curriculum for grades K-12, the objective was successfully accomplished. A total of sixty-four units were prepared, of which sixty-one units met the minimal level of acceptance during the final evaluation of overall quality. In addition, the survey of environmental philosophies, statement of program philosophies, two resource catalogs, plus miscellaneous reports were prepared.

After the first year of operation, objectives related to the preparation and dissemination of the environmental curriculum, and the sponsoring of leadership conferences were elimated because of their being inappropriate for a developmental project.

The development of the institutional objectives was a difficult process, largely because the first objectives developed for the elementary curriculum were decided to be inappropriate because of the difficulty teachers experienced in using them. Considerable time was lost in a rather academic pursuit of the development of objectives without the consideration of their appropriateness or suitability to the educational setting.

Development of the secondary objectives was an easier process, partially because the CDEC staff had experience. In addition, the attitude of the staff towards objectives changed. Initially, the curriculum objectives were considered as specific and narrowly defined directions which would dictate the development of the curriculum. These objectives were academically sacred, not to be altered or violated under any conditions without intensive and detailed investigation and explanation.

After attempting to deal with the above concept of objectives for several months, there emerged among the staff a new concept, one which permitted directional pursuit as well as variation and flexability. The objectives for the secondary program were developed at the onset of the curriculum development process, and were

considered as guidelines and directives, not dictates never to be amended. The objectives, as presented in the discussion of Objective #2, were the product of the development and revision process.

Objective #4, relating to development of criteria and instrumentation to measure institutional impact, was another difficult objective. After the second project year, it was decided not to complete the objective for the reasons stated during the discussion. Had effort continued to be directed towards its completion, it is doubtful the secondary environmental materials would have been completed.

At the time of the writing of this report, the original K-6 instruments are being revised based upon the results of the field testing. The instruments appear to have application in the project entitled "Environmental Education: Curriculum, Information, and Training", an outgrowth of CDEC which is partially funded by a grant from the ESEA Title III, 306 section office of the U.S. Office of Education. One of the objectives of this project is to assess the direct impact of the K-12 curriculum on students.

During March, 1973, the Ohio Department of Education disseminated 27 of the elementary units developed by CDEC. It is reported that one copy of each curriculum guide was sent to every superintendent and every elementary school in Ohio. Additional copies were available free of charge upon request to the ODE Media Center. A limited printing of approximately 125 copies of each of the five secondary units was contracted in September, 1974, to serve the needs of twelve schools in Ohio who were awarded Adaptation Grants from the ESEA Title III in Columbus.

Of concern is the continued availability of all of the curriculum materials to teachers and interested educators. Although the elementary guides received wide distribution, the present supply is nearly exhausted. In addition, the seven units omitted from the first printing were never a part of the dissemination plan. As can be seen from the evaluative results previously discussed, these omitted units were of the same quality as units included in the printing. In fact, the three units which did not meet the minimum level of acceptance were part of the twenty-seven published units.

The thirty-four secondary units have been distributed on a very limited basis. No monies have been identified by either the ESEA Title III office in Columbus, or ODE to disseminate these curriculum materials, even though the final evaluation indicated them to be of a high quality.

Curriculum projects as CDEC, typically find themselves in a position of having neither monies or authorities for the dissemination materials, or the training of teachers for effective implementation of the curriculum package.

Berlak and Timothy[1]. describe the situation in which CDEC and environmental materials find itself:

> At present, these new curricula probably involve no more than several thousand students and perhaps a hundred or more teachers. Many project directors have publicly and privately expressed their concern about the lack of a strategy for disseminating and instituting their work on a wide scale. They probably feel, and rightly, that the sheer enormity of the task defies easy analysis and solution. Certainly we do not take the curriculum projects to task because they have so few plans for implementation. The major goal of these projects has been to develop and not to implement and disseminate; yet the problem remains. With few exceptions, the projects not only have no plans for implementation, but they have few resources to develop and effect such plans.

In order for curriculum innovations to be effective, plans must be made and monies allocated to carry the project through its intended long-term goal. In the case of CDEC, that good is to assist in the development of the environmentally literate citizen. A considerable amount of money, time, and energy has been expended during the three years of the project. The evaluative data indicates the curriculum materials are of high quality, and that these materials offer a practical and immediate method for the implementation of environmental concepts into classrooms throughout Ohio.

During the last year of the project, and for the three months following the official end of the project, requests have been received almost daily from interested educators, both in Ohio as well as outside the state, requesting information about the project and copies of the curriculum materials. The question is continually raised as to whether the three years of work in the development of an effective curriculum program will ever be available to the students and teachers throughout Ohio for whom the efforts and monies were expended.

1. Berlak, Harold and Timothy Tomlinson. 1967, "The Development of a Model for the Metropolitan S. Louis Social Studies Center." Research Report.

Although there have been enumerable changes in schedules, reports, and other disruptions, the contact with officials in the Title III Office has been a valuable and rewarding experience. Without exception, the officials have always been concerned about the quality and impact of an effective education program. They accept in a serious and professional manner their responsibilities, and have always maintained an open and helpful relationship with members of the project staff. They have made every effort to keep abreast of project operations, even though it was done by other means rather than frequent on-site visitations.

This author has been officially involved with Ohio ESEA Title III for six years, five years as project director, and it is his opinion that the Ohio ESEA Title III staff have maintained the experimental and innovative intent of the Title III Guidelines, and that schools who have received monies from this title program, have been provided the opportunity to deal with local educational constraints. Ohio Title III has been an effective program, and should be continued.

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APPENDIX I

SCHOOL SYSTEMS PARTICIPATING IN THE DEVELOPMENT AND EVALUATION OF THE ELEMENTARY AND SECONDARY ENVIRONMENTAL PROGRAMS

SCHOOL SYSTEMS PARTICIPATING IN THE DEVELOPMENT AND EVALUATION OF THE ENVIRONMENTAL PROGRAMS

Elementary Phase

Berkshire Local Schools
Burton, Ohio 44021

Chagrin Falls Exempted Village Schools
Chagrin Falls, Ohio 44022

Cleveland City Schools
Cleveland, Ohio

Euclid City Schools
Euclid, Ohio

Immaculate Conception School
Willoughby, Ohio 44094

Jefferson Local Schools
Jefferson, Ohio 44047

Saint Mary's School
Mentor, Ohio 44060

Shaker Heights City Schools
Shaker Heights, Ohio 44120

Willoughby-Eastlake City Schools
Willoughby, Ohio 44094

Secondary Phase

Akron City Schools
Akron, Ohio 44308

Chardon Local Schools
Chardon, Ohio 44024

Cleveland Diocesan Schools
Cleveland, Ohio

Cleveland Hts./University Hts. Schools
Cleveland, Ohio 44118

Columbus City Schools
Columbus, Ohio 43215

Euclid Schools
Euclid, Ohio 44123

Geneva Area Schools
Geneva, Ohio 44041

Kirtland Local Schools
Kirtland, Ohio 44094

Ledgmont Local Schools
Thompson, Ohio 44086

Madison Local Schools
Madison, Ohio 44057

Mayfield City Schools
Mayfield, Ohio 44143

Painesville Local Schools
Painesville, Ohio 44077

Perry Local Schools
Perry, Ohio 44081

West Geauga Schools
Chesterland, Ohio 44026

Willoughby-Eastlake City Schools
Willoughby, Ohio 44094

Youngstown City Schools
Youngstown, Ohio 44503

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APPENDIX II

CRITERIA FOR MODEL ENVIRONMENTAL EDUCATION PROJECTS

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CRITERIA FOR MODEL ENVIRONMENTAL EDUCATION PROJECTS

(For use in project development)

1. The focus of the project is people centered rather than resource centered, as often true of earlier work in "conservation education."

2. EE is as much concerned with urban as with rural environmental matters, since the majority of our people live in metropolitan areas.

3. The general curriculum thrust of the project is interdisciplinary in nature and as appropriate.

4. A natural way to develop EE projects or programs is to begin with the immediate environments in which the students live.

5. Students are given opportunities to learn about more distant environments, such as those of other communities and countries or vacation lands, and the international aspects of environmental problems and quality at appropriate levels or situations.

6. Student involvement at all phases of EE project development, from planning and learning through evaluation is essential.

7. Students of all ages accept responsibility for some aspects of environmental quality through opportunities to exert some control over their environment at school, at home, in the neighborhood, and in the larger community.

8. Learning through discovery, inquiry, and problem solving techniques is especially appropriate for an EE project.

9. As many of the learning experiences as possible are in the immediate out-of-doors environment.

10. Effective involvement of community people and resources is secured throughout the various phases of the project.

11. An ecological approach, with emphasis on relationships (of living organisms to the various elements of their environments or ecosystems, and with man in the center of such systems) is used in the project.

12. Among community people involved in the project are environmental specialists (naturalists, rangers, marine scientists, ecologists, etc.) and staff members of environmental agencies.

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APPENDIX III

DEFINITION OF THE PACID CONCEPTS

PATTERNS

ADAPTATION

CHANGE

INTERDEPENDENCE

DIVERSITY

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DEFINITIONS

PATTERNS: Organizational patterns are kinds of structures that may be found in rock formations as well as in social groups of people and animals. Functional patterns include traffic movements and classroom schedules. Spatial arrangements are patterns that often please us. Such patterns occur both in nature and in artistic design

ADAPTATION: Over centuries and centuries of time, living and nonliving things alter and develop in the process called evolution. Probably the greatest number of changes over the longest periods of time come about in order to enable an organism to adapt to the environment. Hereditary factors then preserve the continuing elements. The characteristics that enable the organism to adapt best are apt to be the traits passed on from generation to generation, thus ensuring survival of the species.

CHANGE: Both living and nonliving things are constantly changing -- whether among galaxies and planets or within body cells and body systems. Some things remain the same in spite of change. Matter and energy may change in form, but they can never be created or destroyed.

INTERDEPENDENCE: Nothing exists in isolation. Each individual is constantly interacting with living and nonliving things: his family, his belongings, his friends, his world. These people and things also depend on the individual in order to function properly. The process is continuous (as part of the life cycle) even after death, for dead life forms nourish the living.

DIVERSITY: Many likenesses and differences occur among living and nonliving things. A variety of functions, sizes, and structures exist in plants and stars, rocks and animals, processes and people. Yet there are sufficient similarities to permit their classification into orderly patterns. These classifications increase one's understanding of his world.

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APPENDIX IV

ELEMENTARY EVALUATION QUESTIONNAIRE

SECONDARY EVALUATION QUESTIONNAIRE

ELEMENTARY EVALUATION - QUESTIONNAIRE FOR THE FINAL JURY REVIEW

UNIT EVALUATION

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Reviewer's Name

Unit Name

Level

Please complete one questionnaire for each unit you review. The following questions are to be answered by circling a number between 1 and 7. Number 1 indicates that you strongly agree with the statement, and number 7 indicates strong disagreement. Whenever appropriate, you may write detailed comments in the space provided, or on the back of the questionnaire.

Please return by MAY 10, 1974.

	Strongly Agree						Strongly Disagree
1. The rationale covers the whole unit.	1	2	3	4	5	6	7
2. The unit is adaptable to three types of communities. (urban, suburban, rural)	1	2	3	4	5	6	7
3. The objectives are brief, clear, and concise.	1	2	3	4	5	6	7
4. The objectives are appropriate and realistic for students.	1	2	3	4	5	6	7
5. Sufficient activities are included for achieving the objectives.	1	2	3	4	5	6	7
6. Sufficient content material exists in the unit.	1	2	3	4	5	6	7
7. The content is accurate.	1	2	3	4	5	6	7
8. The format is easy to use.	1	2	3	4	5	6	7
9. There are sufficient directions for the teacher.	1	2	3	4	5	6	7
10. Different teaching methods can be employed.	1	2	3	4	5	6	7
11. The material is suitable for the grade level designated.	1	2	3	4	5	6	7
12. It is relatively simple to adapt the material to a class.	1	2	3	4	5	6	7

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	Strongly Agree						Strongly Disagree
13. The books and periodicals in the bibliography section are sufficient to provide the teacher with additional information.	1	2	3	4	5	6	7
14. The unit is exciting or fun to teach.	1	2	3	4	5	6	7
15. I would teach the unit next year.	1	2	3	4	5	6	7
16. Positive environmental values are promoted by the unit.	1	2	3	4	5	6	7
17. There are sufficient whole class activities.	1	2	3	4	5	6	7
18. There are sufficient small group activities.	1	2	3	4	5	6	7
19. There are sufficient individual activities.	1	2	3	4	5	6	7
20. The unit helps the student to learn about the relationships existing between man and his environment.	1	2	3	4	5	6	7

21. What is your general reaction to the unit?
Please circle: Excellent Good Fair Poor

COMMENTS:

PLEASE RETURN TO:

Dennis M. Wint, Director
Center for the Development of Environmental Curriculum
4284 Center Street
Willoughby, Ohio 44094

SECONDARY EVALUATION - QUESTIONNAIRE FOR THE FINAL JURY REVIEW

CENTER FOR THE DEVELOPMENT OF ENVIRONMENTAL CURRICULUM

4284 Center Street
Willoughby, Ohio 44094
Ph: (216) 946-1223

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Reviewer's Name _____ Unit Name _____ Jr. or Sr. High _____ S/C or B/P Area _____

Please complete one questionnaire for each unit assigned to you. The following questions are to be answered by circling a number between 1 and 7. Number 1 indicates that you strongly agree with the statement, and number 7 indicates strong disagreement. Whenever appropriate, you may write comments in the margins of the units themselves, and return them with the questionnaires.

Please return your comments to this office by June 10, 1974.

UNIT CONSIDERATIONS

	Strongly Agree	Moderately Agree	Slightly Agree	No Opinion	Slightly Disagree	Moderately Disagree	Strongly Disagree
1. The rationale covers the whole unit.	1	2	3	4	5	6	7
2. The unit is appropriate for the intended grade level.	1	2	3	4	5	6	7
3. The unit is adaptable to three types of communities (urban, suburban, and rural).	1	2	3	4	5	6	7
4. The objectives are brief, concise and clear.	1	2	3	4	5	6	7
5. The objectives are realistic for the students.	1	2	3	4	5	6	7
6. The unit is motivational (stimulates interest).	1	2	3	4	5	6	7
7. Various teaching methods can be employed.	1	2	3	4	5	6	7
8. Positive environmental values are promoted by the unit.	1	2	3	4	5	6	7
9. The unit helps the student learn about the relationships existing between man and his environment.	1	2	3	4	5	6	7

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	Strongly Agree	Moderately Agree	Slightly Agree	No Opinion	Slightly Disagree	Moderately Disagree	Strongly Disagree
10. Sufficient content material exists in the unit.	1	2	3	4	5	6	7
. The content is accurate.	1	2	3	4	5	6	7
12. The books and periodicals in the bibliography section are sufficient to provide the teacher (or the student) with the additional information.	1	2	3	4	5	6	7
. Sufficient activities are provided to involve the student in critical thinking, problem solving.	1	2	3	4	5	6	7
. Sufficient activities are included for achieving the objectives.	1	2	3	4	5	6	7
15. The unit includes activities for students with different abilities.	1	2	3	4	5	6	7
16. There are sufficient whole class activities.	1	2	3	4	5	6	7
17. There are sufficient small group activities.	1	2	3	4	5	6	7
. There are sufficient individual activities.	1	2	3	4	5	6	7
19. Given the opportunity to do so, I would teach the unit next year.	1	2	3	4	5	6	7
20. Your general reaction to the unit is	1	2	3	4	5	6	7

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APPENDIX V

SUMMARY OF DATA OF THE ELEMENTARY AND SECONDARY UNITS BY THE FINAL JURY EVALUATION

ELEMENTARY EVALUATION RESULTS - FINAL JURY EVALUATION

SUMMARY OF DATA OF UNITS FOR GRADES KINDERGARTEN THROUGH SECOND

Titles for Grades K-2	Av. Resp.	% 1.00-3.00	% Exc/Gd
Preparing for Seasonal Change: Fall	1.91	96.9	93.8
The Terrarium	1.86	87.5	93.8
Dirt and Stuff	1.78	93.8	96.9
Trees	1.87	90.6	83.9
Birds in Our Lives	1.87	90.3	87.1
Kittens	1.86	93.5	80.0
Food Chains	2.24	78.1	75.0
Food Webs	2.61	68.8	@ 56.3
Trash	2.05	90.6	84.4
Average Rating	2.01	87.8	83.5

@ INDICATES UNACCEPTABLE RATING

ELEMENTARY EVALUATION RESULTS - FINAL JURY EVALUATION

SUMMARY OF DATA OF UNITS FOR GRADES THREE AND FOUR

Titles for Grades 3-4	Av. Resp.	% 1.00-3.00	% Exc/Gd
An Environmental Quality Index for the School and Neighborhood	1.89	89.7	86.2
*Man's Adaptation	2.22	79.3	69.0
The Vacant Lot	2.25	80.0	70.0
The School Lawn	1.88	90.0	96.6
The Cemetery	2.30	76.7	75.9
Giants on the Land: Trees in Your Environment	1.58	90.0	83.3
Water	2.33	73.3	70.0
The Breath of Life or Death: Air Pollution	1.77	100.0	89.7
Wild Ideas With Wild Plans	1.94	90.0	82.8
The Endangered Predator and His Prey	2.83	@60.0	@37.9
Poetry in the Environment	1.92	86.7	86.7
Average Rating	2.08	83.2	77.1

*INDICATES TITLES OF UNITS NOT PRINTED BY THE OHIO DEPARTMENT OF EDUCATION
@INDICATES UNACCEPTABLE RATING

ELEMENTARY EVALUATION RESULTS - FINAL JURY EVALUATION

SUMMARY OF DATA OF UNITS FOR GRADES FIVE AND SIX

Titles for Grades 5-6	Av. Resp.	% 1.00-3.00	% Exc/Gd
Problem Solving	2.24	75.0	75.0
Succession and the Pond Community	2.53	75.0	@ 61.3
* Field and Forest Succession	2.27	78.1	73.3
* Weather and Climate	1.73	96.9	87.5
* Minerals	2.30	75.0	68.8
Animals and Their Habitat	1.74	93.8	93.8
* Soil and Erosion	2.04	87.1	86.7
Our Native Lands: Conserve and Preserve	1.97	84.4	78.1
Scars Upon the Land	2.46	81.3	75.0
Water: Life-Blood of the Earth	1.92	90.6	84.4
* Air Pollution: Part I	1.85	90.6	90.6
* Air Pollution: Part II	2.10	81.3	81.3
Noise Pollution	1.81	93.8	86.7
How to Plan a Cleanup Campaign in the Local Community	1.93	96.9	90.6
Average Rating	2.06	85.7	80.9

* INDICATES TITLES OF UNITS NOT PRINTED BY THE OHIO DEPARTMENT OF EDUCATION

@ INDICATES UNACCEPTABLE RATING

SECONDARY EVALUATION RESULTS OF ALL REVIEWERS - FINAL JUR. EVALUATION

SUMMARY OF DATA FOR JUNIOR HIGH AND SENIOR HIGH SCHOOL UNITS

	JUNIOR HIGH SCHOOL				SENIOR HIGH SCHOOL			
	Socio-Cultural		Bio-Physical		Socio-Cultural		Bio-Physical	
	Av. Resp.	% 1.00-3.00	Av. Resp.	% 1.00-3.00	Av. Resp.	% 1.00-3.00	Av. Resp.	% 1.00-3.00
Earth Thoughts	1.97	94.7	1.72	94.1	1.72	94.7	1.60	94.4
Quality of Life	1.81	100.0	1.78	88.2	1.66	89.5	1.64	94.4
Environmental Inventory	1.89	94.7	1.76	100.0	2.05	89.5	2.01	94.4
Environmental Management	1.78	94.7	1.64	100.0	1.97	94.7	1.61	94.4
Politics of Environment	1.78	94.7			1.77	94.7		
Community Problems	2.64	73.7	2.01	82.4	1.72	94.7	2.04	88.9
Futurism	1.60	100.0	1.43	100.0	1.99	89.7	1.64	94.4
Average Rating	1.92	93.2	1.72	94.1	1.84	92.5	1.76	93.5

SECONDARY EVALUATION RESULTS OF ALL REVIEWERS - FINAL JURY EVALUATION

SUMMARY OF DATA FOR JUNIOR HIGH AND SENIOR HIGH SCHOOL UNITS

	Average Response	% 1.00-3.00
Me and My Environment	2.03	86.7
Art and Architecture	1.84	86.7
Music in the Environment	2.00	80.0
Leisure/Work (JHS)	2.19	73.3
Visual Reflections of Our Cultural Environment	1.86	80.0
The Performing Arts	2.39	73.3
Leisure/Work (SHS)	1.41	100.0
Mathematics	1.79	80.0
Total	1.94	82.5

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APPENDIX VI

COMPARISON OF THE RESULTS OF THE ELEMENTARY UNITS INCLUDED IN THE CURRICULUM PACKAGE VERSUS THOSE OMITTED FROM THE CURRICULUM PACKAGE AS PRINTED BY THE OHIO DEPARTMENT OF EDUCATION

ELEMENTARY EVALUATION RESULTS

COMPARISON OF THE RESULTS OF UNITS INCLUDED IN THE CURRICULUM PACKAGE
AND THOSE OMITTED FROM THE CURRICULUM PACKAGE AS PRINTED
BY THE OHIO DEPARTMENT OF EDUCATION

	TEACHERS			NON-TEACHERS			TOTAL		
	Av. Resp.	% 1.00-3.00	% Exc/Gd	Av. Resp.	% 1.00-3.00	% Exc/Gd	Av. Resp.	% 1.00-3.00	% Exc/Gd
Units for grades 3-4									
Total Av. Rating	2.01	85.7	81.4	2.17	79.9	72.3	2.08	83.2	77.1
Av. Rating of five unit omitted in the printed pkg.	2.04	86.7	80.0	2.41	71.4	57.1	2.22	79.3	69.0
Av. Rating of ten units included in the printed pkg.	2.01	85.6	81.6	2.14	80.7	73.8	2.07	83.6	77.9
Units for grades 5-6									
Total Av. Rating	2.09	83.3	80.2	2.02	87.2	81.8	2.06	85.7	80.9
Av. Rating of the six units omitted in the printed package.	2.07	84.3	84.5	2.01	85.6	77.3	2.05	84.8	81.4
Av. Rating of the eight units included in the printed pkg.	2.11	83.3	77.0	2.03	88.4	85.2	2.08	86.4	80.6